

# COAL AGE

Vol. 6

NEW YORK, OCTOBER 31, 1914

No. 18

“BE VERY SLOW TO BELIEVE THAT  
YOU ARE WISER THAN ALL OTHERS;  
IT IS A FATAL BUT COMMON ERROR.”

FEW people are so constituted that they can accept advice with sparkling eyes, but any man who will balk at the aphorism quoted above, needs watching. If he is allowed to follow his own inclinations long enough he'll probably come to a sudden and violent end.

Reading *between the lines* on tombstones will recall many examples to mind. Here are a few we discovered in a twenty-acre lot, and it was not entirely filled at that:

A miner who couldn't agree with his "buddy" and the mine foreman about the danger of a piece of loose draw slate in his room.  
A driver who knew that all mules would not kick.  
A fireboss who could detect gas with a naked light.  
A salaried union official who was on a company payroll as well.  
A mine foreman who made a practice of riding loaded trips.  
A checkweighman who developed a system of dummy check numbers.  
A miner who used steel tamping bars.  
A trip rider who enjoyed being tickled with the 550-volt current.  
A fireman who depended on check valves on a high-pressure boiler.

Then there were several we were not quite sure about:—

A fellow killed in a drunken brawl.  
A trapper run down by an electric locomotive.  
A machine-runner electrocuted.

We gave them the benefit of the doubt, recalling the words, "Be very slow to believe." Since making the gruesome journey through the twenty-acre lot, we have discovered an even more distressing obituary, illustrating the truth of the aphorism quoted.

The Rev. Caleb Colton, who wrote the precept and published it in 1821, blew out his own brains in 1832, principally because he lost a large sum of money in gambling hells.

This in spite of the fact that he was a clergyman and a man of brilliant mind. Surely his advice, backed up as it is by the tragedy of his life, rings true.

## Discussion of Mining Laws, Legislation and Mine Regulations

BY J. T. BEARD

**I**N THE CAMPAIGN FOR IMPROVEMENT and the securing of higher efficiency and safety in mining, nothing is of greater importance than the careful consideration of those features and elements that relate to and control the management and operation of mines. These controlling features are quite generally included in the various requirements of mining laws and mine regulations.

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It is a deplorable fact that state mining laws are, in many cases, the result of unwise and biased legislation. Too often has mine legislation been influenced if not controlled by lobbyists whose main object and purpose is to secure the enactment of laws that will favor their own selfish ends. Even the appointment of committees and commissions to draft suitable laws for presentation to legislative bodies has not secured the desired freedom from the same undermining influences; and "minority" and "majority reports" have, alike, been presented to legislatures for their action.

While our law-makers cannot always be expected to be well informed in regard to the practical requirements of mining, their purpose as honest legislators should be to eliminate from their enactments all discriminating features, so that the laws they enact will secure greater safety to mine workers and equal justice to all.

A mining law that imposes unequal burdens on the industry in different districts of the same state, or makes it impossible for coal operators in one state to compete successfully with those of another state tributary to the same market is justly open to criticism. A law that discriminates between mines, in respect to their classification, so as to make it impos-

sible for one mine to operate successfully in competition with other mines working under the same conditions and supplying the same market would be discriminative and likewise open to just criticism. Much of the difficulty from this source has fortunately been removed through the efforts and work of the various interstate commissions. A law that permits the domination of any class or individual over another class or individual, or restricts individual rights and freedom without sufficient cause or reason is unwise and again open to criticism.

There is no work more constructive or more important in journalism, especially in a paper devoted to the welfare and interests of a single industry, than the work of simplifying and improving existing mining laws, to the end that greater safety and justice may be secured in all branches of the work. In the accomplishment of this task, the editors of COAL AGE ask the earnest coöperation of all practical mining men, in every branch of the industry. We invite such criticisms of existing mining laws as have appeared from time to time in COAL AGE; and ask that correspondents draw attention to inconsistencies, omissions or lack of clearness, in the wording or intended meaning of laws as they appear on the statute books of their respective states.

A question was recently asked, COAL AGE, Oct. 3, p. 563, in respect to the meaning of the designation "gaseous mine," in the Bituminous Mining Law of Pennsylvania. In the present issue of the paper, a correspondent questions the justice of the requirement of the Bituminous (Penn.) Mining Law, Art. 24, Sec. 7, under which all examination papers of candidates must be filed in the Department of Mines at Harrisburg and not returned to the candidate.

*Let us have a full discussion of all points relating to mining laws, legislation or mine regulations, by those affected by such laws. Much good can be done by such a frank discussion.*

## Test of Rice Barriers at Experimental Mine

BY GEO. S. RICE\* AND L. M. JONES†

**SYNOPSIS**—The explosion, specially arranged for the visit of the American Institute of Mining Engineers on Oct. 9, was of a mild order. This type of explosion is hard to stop, and the ordinary barriers which have proved efficacious in the most violent explosions often fail to restrain those which are less violent. The Rice barriers were proved equal to the demands made on them by the conditions of the experiment.

■

One of the excursions arranged for the recent meeting of the American Institute of Mining Engineers at Pittsburgh was to the U. S. Bureau of Mines experimental mine, near Bruceton, Penn. This trip was made on the afternoon of Oct. 9. Many members of the Institute, accompanied by some of the Pennsylvania state inspectors, and other mining men, probably about 200 in all, went out to the mine by train and automobiles. They first entered the workings to inspect the arrangements for an explosion test and the "barriers" that had been erected to limit the explosion. Outside the mine, they saw demonstrations with full-size models of two of the rock-dust barriers, which had been erected to show how a cloud of rock dust is discharged from them by the force of an explosion.

### CEMENT-GUN WORK

Afterwards, a "cement gun" was used to cover with a layer of concrete some boards set up like a mine stopping. The concrete consisted of 2 parts sand and 1 part cement and was reinforced with wire mesh which had been previously tacked on the boards. This gun had recently been used in the mine to repair countless breaks in the concrete lining of the mine, caused during previous explosion tests; it had also been used to coat the inner part of the entries with a thin layer of 2 parts sand and 1 part of cement without any reinforcement. The object of the coating was twofold; to enable the entry to be more easily cleaned after each test, and to see whether the coating would protect the shale and bone-coal roof from air slaking.

The conditions are somewhat severe at this mine on account of the explosion experiments, so it is hardly a fair test of the durability of the coating. It is hoped that this method of protecting the roof and walls may be durable in commercial mines, and if so, it would be a great economy to employ it and indirectly it would add to safety in the prevention of falls.

After these exhibits the visitors moved up on the hill over the main entries to witness the explosion test. After the word had been given that the electrical connections had been made into the mine, and the physicist had made his tests to determine that the electric circuits were complete, warning whistles were blown, and 30 sec. later the explosion was started by throwing an electric switch in the observatory.

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### EVIDENCES AT THE SURFACE

The first evidence of the explosion was a puff of light dust, accompanied by a muffled sound coming from the mouth of the air course. This was followed by a stronger and more continued puff of dust and smoke from the same point. While this was issuing there was a puff of light dust from the main entry, and after an interval of several seconds this was followed by a prolonged outburst of dust and smoke accompanied by a crashing or booming sound.

The explanation of these separate puffs and sounds appears to be that the first small puff coming from the air course was the shock wave from the cannon; the second and larger one was when the pressure wave issued from the explosion in the butt entry; the first puff from the main entry appeared to be caused either by the shock wave from the cannon, or the shock wave from the explosion itself in the butt entries; the larger burst of

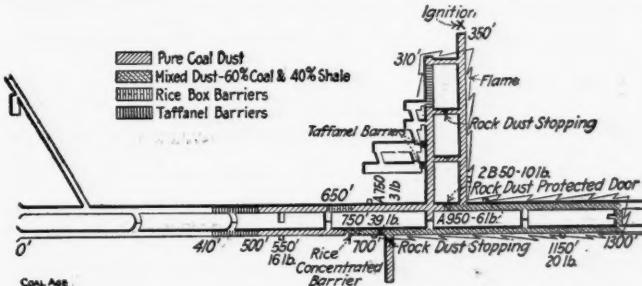


FIG. 1. TEST AT THE U. S. EXPERIMENTAL MINE TO PROVE EFFICACY OF NEW ROCK-DUST BARRIERS

dust and smoke was due to the explosion in the main entry, which as the manometer records later showed attained its maximum immediately before striking the concentrated barrier.

Perhaps one of the most striking features of this experiment was the demonstration of the present knowledge of dust-explosive phenomena which enabled those in charge to plan the conducting and limiting of an explosion along a predetermined path.

### A LARGE PART OF THE MINE WAS FREE FROM AFTER-DAMP

Owing to the explosion being well in the interior of the mine, and as the fan was set to barely turn around, no smoke or dust was observed from either entrance after the outbursts above mentioned. A demonstration was then given of the oxygen breathing apparatus by two Bureau mine-rescue crews of five men each. The advance party entering the main entry carried a guide rope, also a canary to observe whether or not it would be affected by the fumes.

Owing to the retraction of the gases after the explosion the party had to go in 600 or 700 ft. before encountering the afterdamp, which showed its presence by overcoming the canary. After the squad had returned, the fan was started, so as to blow out a large amount of smoke and gas from the main entrance. Then ventilation

was reversed and many of the visitors including inspectors entered and observed the effects of the explosion.

#### DETAILS OF ARRANGEMENTS OF TEST

Referring to Fig. 1, the explosion was initiated by a blown-out shot of 4 lb. of black powder located at the face of the second butt entry, 350 ft. from the air course. Pure Pittsburgh coal dust was distributed for the 350 ft. between the face and the air course at the rate of 2 lb. per lin.ft. For the first 50 ft., and in the inner crosscut it was placed on side shelves but in the balance of the zone, the dust was concentrated on shelving placed across the airway. It has been found that the maximum intensity of explosion is obtained by this method of loading.

In the air course between the second and first butt, there was a rock-dust protected ventilating door, which was located here with the expectation that it would not permit the explosion to pass through it and travel outby along the air course. On the inbye side up to the last crosscut of the airway, a mixture of 60 per cent. coal dust and 40 per cent. shale was loaded at the rate of  $3\frac{1}{2}$  lb.

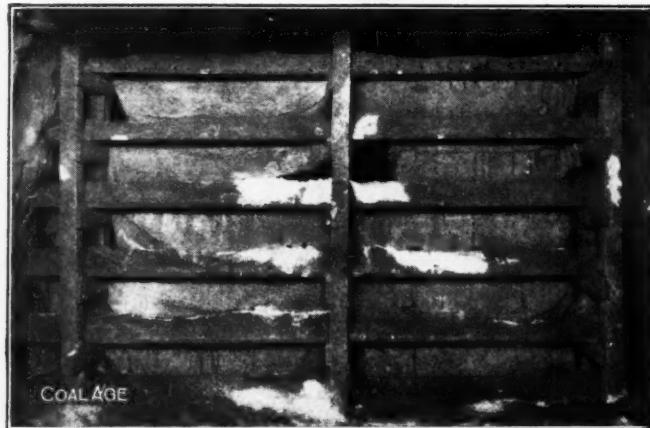


FIG. 2. VIEW FROM NO. 1 BUTT OF REMAINS OF ROCK-DUST STOPPING IN 200-FT. CROSSCUT

per lin.ft., the mixture being concentrated on cross shelves. This distance is 350 ft. There was a like loading in the last crosscut to the main entry, and out along the main entry 550 ft. At the end of this loaded length of entry was a concentrated barrier. Thus there was a total length of 1300 ft. that the explosion was expected to follow from the origin to the point of extinguishment of the flame.

#### COAL DUST TO TEST VALUE OF BARRIERS

In order to test the efficiency of the various stoppings, pure coal dust was placed in the first butt and in the air course outby the protected door between the butts, also in the main entry outby the concentrated barrier, and in the right butt. For if the flame of the explosion had passed the barriers and caused the ignition of the pure dust beyond, it would have made a much more extensive explosion, and the flame might possibly have issued from the entrances.

Neither the instruments nor other records gave indication of ignition of the pure coal dust in the zones beyond the barriers. Besides the barriers which limited the explosion there were others supplementing these placed outby the several extra zones of pure dust, for the purpose of exhibiting these types of barriers and also

as a safeguard to the mine portals in case the limiting barriers previously described failed to extinguish the explosion. These supplemental barriers were a Rice box barrier in the air-course outby the butt entries and Taffanel barriers in the air course and main entry. The Taffanel barriers were loaded with shale dust and limestone dust was placed on the other barriers.

#### THE STONE DUST MIXED WITH THE COAL DID NOT WHOLLY PREVENT INCREASE OF PRESSURE AS EXPLOSION PROGRESSED

The pressures were registered on three French and three British manometers. The registration of the passage of the flame was recorded by strips of tinfoil in the various stations, which, except in the butt entries, are 100 ft. apart. To check these records tufts of gun cotton and matches were placed at intervals in the roof. However, it was found that the latter were not trustworthy with the method of loading on cross shelves which had been adopted. Judging from surface-gallery effects, probably the cloud of coal dust and mixed dust make a thick barrier or veil along the roof, through which the flame cannot penetrate. In order to obtain the maximum effect a great excess of dust was used.

The stations in which pressure manometers were placed and the maximum pressures obtained are as follows:

PRESSURES ATTAINED AT VARIOUS POINTS IN MINE		
Station	Lb. per Sq.In.	Location and Remarks
2B 50	10	300 ft. from origin.
A 950	6	In air course after right-angle turn.
A 750	3	In air course outby the door barrier.
E 1150	20	In main entry 100 ft. outby the last crosscut.
E 750	39	In main entry inbye the concentrated barrier.
E 550	16	In main entry inbye the concentrated barrier.

(These pressures may be slightly revised upon more thorough measurement and calculation of the records.)

It will therefore be observed that the pressure of the explosion after passing out of the butt entry increased in intensity on its passage along the predetermined path until the flame was extinguished by the limiting barriers.

#### THE SEAT OF THE EXPLOSION DEVELOPED LITTLE PRESSURE

It is worthy of note that the pressure in the entry in which the explosion originated did not rise very high. The explanation that might be made of this is that the entry was not long enough and in a sense the area was restricted. The outlets were choked momentarily, at the mouth, by the blast striking against the rib of the air course, on the outby side by the ventilating door, and, inbye because it was approaching a dead end.

Had the explosion been well under way, this restriction in outlets would not have checked the intensity of the explosion. The inertia of the air had to be overcome in order to stir up and mix the dust and air.

#### THE ROCK-DUST STOPPING WAS INSTANTANEOUSLY EFFECTIVE

The flame penetrated into the Taffanel barrier in No. 1 butt about 50 ft. but did not pass through it. It did not pass through the rock-dust stopping in "200" crosscut. This stopping consisted of two sets of six shelves each, with a vertical spacing of one foot, supported by posts. There was a space between the two sets of shelves about a foot wide. This space and the shelves were filled with limestone dust.

The theory on which the device was designed is that if a set of such shelves was placed on each side of a stopping, an advance air wave might overthrow the stopping and the shelves on the far side, but the shelves on the near side would remain up and the explosion wave proper would blow the dust off, forming a cloud which would quench the flame.

The space filled with rock dust in this test acted like a solid stopping and overturned the shelves on the No. 1 butt side. The other set on the No. 2 butt side remained up and most of the dust was blown off the shelves. Notwithstanding the coal-dust loading in this crosscut on both sides of the stopping, the flame failed to pass beyond.

#### THE OTHER ROCK-DUST BARRIERS ALSO PROVED EFFECTIVE

The protected ventilating door in the air course also checked the flame. The planks of the rock-dust side-compartments were blown outbye but most of the floor boards of the upper compartment still hung from chains. Some flame passed through the barrier but died away 50 ft. beyond. Evidently it took this distance for an effective dust cloud to be formed and to cool the gases below the ignition temperature of the dust carried along by the explosion. As the pure coal dust placed outbye the door was not ignited, evidently the rock dust blanketed the flame too quickly to permit ignition.

No evidence of flame was noted in No. 1 right butt inbye the rock-dust stopping which was entirely thrown down. The concentrated barrier in the main entry was dismantled, some of the timbers being carried 150 ft. and the limestone dust well scattered. No evidence of flame was noted outbye its original position.

In the air course the boxes of the box barrier, which terminated the coal-dust zone outbye the ventilating door, but which were not called on to extinguish the explosion, were all on the floor, but the bottom boards were still suspended from chains and still held much limestone dust. Three of the boxes were found 25 ft. inbye the position of the first box before the explosion; presumably these were carried inbye by the inrush of air from outside after the explosion had occurred.

There was little coked dust along the course of the explosion. This is not necessarily to be regarded as indicating that there was little heating effect. The ribs, roof and posts were all damp and it is known that coke deposition seldom is found under these conditions.

#### TAFFANEL BARRIERS HAVE FAILED IN SLOW-MOVING DUST EXPLOSIONS

In conclusion, it might be stated that all the explosion-checking devices used in this explosion test have been tried many times in the Experimental Mine explosions and all of them with the exception of the Taffanel barrier, which has failed in low-pressure slow-moving explosions, have always proven effective in stopping the phenomena. Installation of any of these types for separating different splits, panels or sections of a mine from each other or the balance of the mine would undoubtedly be a big step in advance toward reducing the number of lives lost in large explosions. The Bureau engineers are now preparing a publication describing these devices and it is strongly recommended that they be installed in bituminous mines in connection with a definite plan for making coal dust inert by watering or rock-dusting.

#### Extracts from a Superintendent's Diary

The most difficult position about our diggings to fill and keep filled, is that of school teacher. We have had them of every height, weight, sex and disposition, but we have never had but one who stayed an entire school year. That one left today, this being the last day of the term. During the last four weeks, however, she has been without an assistant, having tried four during the year and at last deciding to complete the year single-handed rather than break in another one for so short a time.

The old story about "give a dog a bad name" has undoubtedly been responsible in a way for many of our troubles in this respect during recent years, and has had a marked effect no doubt on the type of applicants who apply for our school.

Each new crop of boys and girls seems to have an original way of making life miserable for the teacher, and in spite of all warnings handed down from year to year, each succeeding teacher seems always to have plenty of surprises awaiting her.

Nor are all of the misunderstandings and hasty departures chargeable to the pupils. Several of the teachers (I recall a man and a woman during my reign) have been vanquished by irate mothers who objected to having their sons flogged. We have had a few rather good-sized teachers at that, but some of the mothers of our camp wouldn't consider size or sex of any opponent as a drawback if once they were determined to breathe revenge.

I was much amused at the comments of one of my sons several days after the arrival of the teacher who has just closed her year's work; and reading between the lines I decided that here at last was a teacher who could keep them guessing. My youngster remarked that the teacher was cross-eyed and they couldn't tell whom she was looking at, and besides that she was bigger than any boy in the room.

The boys had a way of working in pairs; one boy would attract a teacher's attention and while she was looking at him, he would telegraph instructions with his feet to his partner who would immediately get into action. But with the new teacher, every boy imagined that she was always looking straight at him and he hesitated about making a move.

And then to add to the discomfiture of the boys, she had a way of working into the good graces of all of the parents of the camp. Among other things, she organized a School Improvement Association in which everybody has become much interested, and as a result, as one might expect, all of the parents are much impressed by the teacher.

Several of the boys were foolish enough to appeal to their mothers, as they had long been in the habit of doing, before they realized just how matters stood between the teacher and the mothers; the results were far from satisfactory from the standpoint of the boys, and from that time on, the pupils when in trouble were content with the best settlement they could obtain from the teacher without outside intervention.

And now at night as the boys gather to talk over past events and make plans for the future, they tell the younger lads about how they used to scare away teachers by threatening to blow them up with dynamite, but they always cleverly change the subject when the listeners begin to ask questions about recent history and the cross-eyed one.

# The Hampton Roads Coals--I

BY F. R. WADLEIGH\*

**SYNOPSIS**—This is the first of a series of articles that will cover in detail all phases of marketing and shipping the different coals handled at Hampton Roads. This installment gives a brief historical sketch of the port and a general review of coals handled.

¶

It has been impossible to ascertain the exact date of the first coal shipments from Hampton Roads, but it is certain that these shipments were from the mines in the Richmond, Va., coal basin. These mines were opened in 1750, and in 1832 had their maximum output of 132,000 tons, which gradually decreased until in 1882 it was only 54,000 tons.

For years this coal had a monopoly of the coastwise trade in bituminous coal, barges being brought down the James River and through Hampton Roads to New York and Philadelphia. In 1842, the coal was used at the Portsmouth, Va., Navy Yard, the Navy Department having a contract with the Clover Hill mines for 800 tons in that year.

During the Civil War, some of this fuel was used by the Confederate ships and blockade runners. Either

large ships had either to go to Newport News for bunkers or be coaled from barges.

The Newport News and Lamberts Point terminals were gradually enlarged, five more coal piers being installed up to 1914 when two more, the largest on the Atlantic Coast, were put in operation.

For some time previous to 1882, bunker coals for Norfolk were brought down by barge from Baltimore, but the first regular bunkering business in Hampton Roads was started by Belloni & Co., of New York, who in October, 1882, sent F. E. Tweddell to Newport News, to open an agency there for supplying steamships with coal. As the good qualities of the West Virginia and Virginia coals became better known, aided by judicious advertising methods, the shipments from Hampton Roads increased rapidly from less than 60,000 tons in 1883 to 11,994,665 tons in 1913.

## A COMPARISON WITH THE WORLD'S LARGEST COALING PORTS

Taking the three Hampton Roads coaling stations together, Lamberts Point, Sewalls Point and Newport



GENERAL VIEW OF THE THREE MAIN PIERS OF THE

this coal, or that from the semi-anthracite mines in Montgomery County, Va., was also sent to Norfolk at that time and was used by the Merrimac in her fight with the Monitor in Hampton Roads.

### THE EARLY OPERATIONS

The Chesapeake & Ohio R.R. began shipping coal from Newport News a short time previous to 1882, and before this they had loaded coal at Richmond, and sent it down the James River. In the fall of 1882, they were doing quite a large shipping business to Northern ports as well as in bunkering steamships, something over one hundred ships calling for bunkers between October, 1882, and May, 1883.

In 1884, the Norfolk & Western R.R. started work on its first pier at Lamberts Point, but the first regular shipment of Pocahontas coal to Norfolk was made in March, 1883. Between this time and the completion of the new pier, the coal was dumped over a small pier at Norfolk, which could only accommodate barges; any

News, the shipments from the Roads are exceeded by only two tidewater coal-shipping ports in the world. Cardiff with its five docks and basins, Roath, Queen Alexandra and Bute Docks, Barry and Penarth exporting 22,574,592 tons in 1913 and Newcastle with its River Tyne docks and export shipments of 15,407,796 tons in 1913, both including foreign bunkers.

If we consider foreign shipments alone, the Hampton Roads tonnage does not stand so well as the following table shows, all of the tonnage being for 1913:

Port	Cargo	Bunker	Total
Cardiff.....	19,282,496	3,292,076	22,574,572
New Castle.....	13,316,437	2,091,359	15,407,796
Hull.....	4,629,289	1,473,673	6,102,962
Newport.....	4,679,212	712,972	5,392,184
Blyth.....	3,973,495	408,313	4,381,808
Swansea.....	3,511,133	502,903	4,014,036
Sunderland.....	3,014,200	312,217	3,326,417
Methil.....	2,576,852	202,063	2,779,915
Burntisland.....	1,938,339	177,320	2,115,659
Glasgow.....	1,927,059	1,270,182	3,208,521
Immingham.....	1,755,641	347,442	2,103,083
Grangemouth.....	1,434,747	200,103	1,634,850
Leith.....	1,420,678	233,815	1,654,492
Goole.....	1,300,624	112,074	1,412,698
Grimsby.....	1,197,799	1,013,860	2,211,659
West Hartlepool.....	1,245,293	242,568	1,487,860
Liverpool.....	438,142	3,368,809	3,806,951
London.....	3,571	1,348,308	1,351,679

\*Consulting engineer, 426 Real Estate Trust Bldg., Philadelphia.

UNITED STATES			
	Cargo	Bunker	Total
Hampton Roads.....	2,424,972	972,230	3,397,202
Philadelphia.....	939,944	599,528	1,539,472
Baltimore.....	775,818	429,978	1,205,796
New York.....	4,192,264	.....	.....
New Orleans.....	418,726	.....	.....

Comparing the total shipments from the larger British ports, with the Hampton Roads totals, only Cardiff and Newcastle show larger shipments, as follows:

Ports	Total Shipments	Ports	Total Shipments
Cardiff.....	25,374,572	Lamberts Point.....	5,598,716
Newcastle.....	20,613,767	Newport News.....	3,111,017
Hull.....	7,035,726	Sewalls Point.....	3,283,677
Newport.....	6,192,184	Total.....	11,993,410

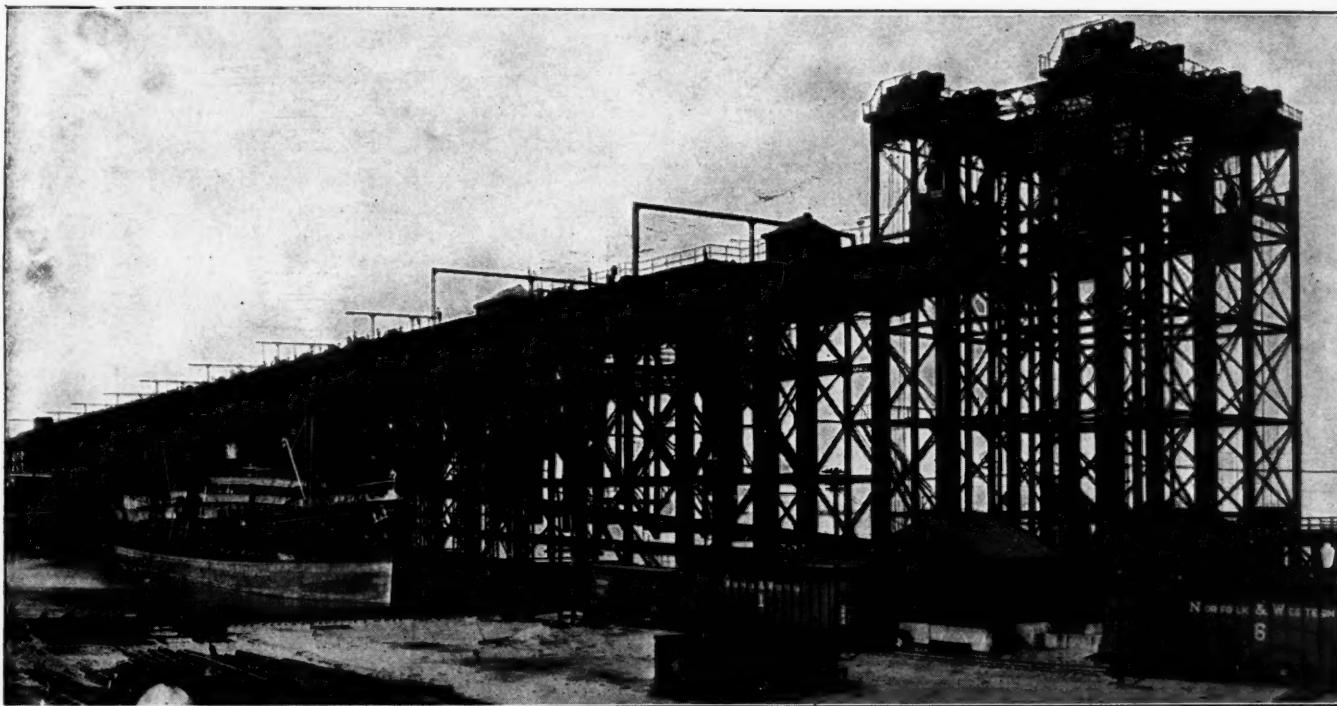
#### THE HAMPTON ROADS COALS

The coals that have made Hampton Roads known all over the world are the high-grade semi-bituminous steam fuels from the New River-Pocahontas coal area of Virginia and West Virginia. These are known to the trade

42 deg., Longitude 77 deg., it extends southwestward through West Virginia, Maryland, southeastern Ohio, eastern Kentucky, Virginia and central Tennessee, ending in western Alabama, Latitude 33 deg., Longitude 88 deg. About half-way down and on the eastern border of this field, lies the New River-Pocahontas coal area, covering approximately 2575 square miles.

To give the clearest possible idea of the production, quality and handling of these coals, the beds and fields from which they come, the data given is grouped under each railroad system, with a general classification as follows:

Norfolk & Western	Chesapeake & Ohio	Virginian Railway
Pocahontas Flat Top	New River	New River
Tug River (Pocahontas)	Kanawha	Kanawha
Thacker, including Kentucky	Thacker	
coals along Tug River		
Clinch Valley		
Kenova		



NORFOLK & WESTERN RY., AT HAMPTON ROADS, VA.

as "Pocahontas" and "New River" coals, names derived from the geographical location of the coal beds, "Pocahontas" from the town where the first mine was opened, and "New River" from the river of that name. Of a similar nature, structure, appearance and quality and coming from the same geological measures, these are the standard for steam coals in this country. They are also the only ones that can compete on equal terms with the famous steam coals of South Wales, which have so long had a monopoly of the coal markets of South America and the Mediterranean, though they are now being displaced to some extent by our coals. Their high-heating value, purity and comparative freedom from smoke of combustion, make them of especial value and it is of the greatest importance that their possibilities should be fully recognized; the manner in which they are mined and handled should also be given close attention so that they will last as long as possible.

These coals are part of the Great Appalachian Coal Field, which is about nine hundred miles long, and from thirty to one hundred and eighty miles wide. Beginning near the northern line of Pennsylvania, Latitude

The mining methods and preparation are similar in all the fields and will be described under one general heading.

It will be noticed that the New River field is served by both the Virginian and Chesapeake and Ohio roads. Most of the New River coal mined on the Virginian alone is from the Beckley bed, while some of the mines are served by both roads, as given in the following list:

Cranberry	Beckley	Winding Gulf
Lochgelly	Sprague	Mac Alpin
Beech Creek	Prosperity	Tams
Summerlee	Raleigh C. & C. Co.	Eccles
Carlisle	Sullivan	Glen White
Oakwood	Wood-Peck	Wingrove
Mabscott	Pemberton	Scarbro

The Kanawha, Glen Jean & Eastern R.R., a small line (16 miles) owned by one of the large New River coal interests, connects the Chesapeake & Ohio and Virginian, so that some mines can ship coal over either of the two trunk lines; these mines are as follows:

Sherwood	Kilsyth
Price Hill	Derryhal
Mt. Hope Coal Co.	Nichol
Tamroy	Sun
Graham	Sugar Creek
Oswald	

The following tables will serve as a summary of gen-

eral data regarding the Hampton Roads coals, their distribution as to fields and districts and their handling on the market. The division into districts or fields is an arbitrary one adopted by the railroads, but it corresponds quite closely to the actual division as regards the kinds of coal.

Although there are eight railroads with terminals on Hampton Roads, all of the coal is brought in over three,

No. of Piers	Depth of Water (Feet)	Maximum Capacity (Tons)	Tonnage 1913
3	32	6800	5,598,71
5	34	9000	3,111,10
1	32	1500	3,283,67

the Norfolk & Western Ry., Chesapeake & Ohio Ry., and the Virginian Ry. Each has its own districts and coals.

## NORFOLK & WESTERN RAILWAY

Location	Freight Rate	Max. and Min. Dist. from Hampton Roads	Max. and Min. Dist. from
Bluestone to Welch and branches	\$1.40	375	450
Welch to Laeger and branches	1.40	399	437
Laeger to Williamson	1.50	422	470
Williamson to Kenova	1.50	470	489
Richlands to Norton, Va.	1.40 @ 1.50	404	466
Montgomery Co., Va.	.....	295	310
<b>E &amp; OHIO RAILWAY</b>			
Quinnimont to Gauley River	\$1.40	371	402
Gauley River to Ashland	1.50	407	555
West of Big Sandy River	1.55	509	631
<b>IAN RAILWAY</b>			
.....	\$1.40	388	427

## VIRGINIAN RAILWAY

**\$1.40**      **388**      **427**

## NORFOLK & WESTERN RAILWAY

This was the first of the three roads to build large coal piers at Hampton Roads, the No. 1 pier having been put into operation in 1885. This road, originally the Atlantic, Mississippi & Ohio, the main line running from Norfolk, Va., to Bristol, Tenn., 408 miles, built a branch line to the Pocahontas coal field in 1882-3, when the first mine was opened. This branch was gradually extended toward the Northwest, with the opening of more mines, until in October, 1892, the entire line was completed to Columbus, Ohio. At that time, there were 25 mines in operation with an output of 2,528,000 tons, all mining being in the No. 3 Pocahontas bed, with the exception of four small operations near Kenova, in the Kanawha measures.

Today, this road has 2037 miles of main line and serves a total of 248 mines, of which 160 are in the Pocahontas coal beds, the others mining the higher volatile gas and splint coals of southwest Virginia, West Virginia and Kentucky.

To the foresight and sagacity of President F. J. Kimball, of the Norfolk & Western, is due a large share of the credit for the opening and development of the Pocahontas coal field. Far-seeing, clean, upright, a tireless worker, he carried out his ideas in the face of a great many discouragements, building to the coal fields, bringing in capital for and encouraging, their development, then extending his road so as to enter Western markets. The present size and prosperity of his road is largely due to the final carrying out of his plans by men trained under him and in sympathy with his ideas.

The total shipments of the Norfolk & Western for 1913 amounted to 20,768,850 tons, of which 16,000,739 came from the Pocahontas beds. The distribution of these shipments was: Tidewater, 22.3 per cent; Eastern Line Trade, 13.4 per cent.; Western Line Trade, 64.3 per cent. To haul this immense tonnage, which is 60 per cent. of its total freight movement, 1065 locomotives are used and coal cars as follows:

60,000 lb. capacity 1067	100,000 lb. capacity 13,272
80,000 lb. capacity 925	115,600 lb. capacity 13,509
85,000 lb. capacity 2914	180,000 lb. capacity 750

The standard train handled into Lamberts Point weighs 4200 net tons, excluding the locomotive.

All coal for Tidewater or Eastern points is hauled from the mines to Bluefield, W. Va., where it is weighed and classified. Bluefield is 363 miles from Hampton Roads and 12 miles from the nearest mine, the Pocahontas Field, extending 422 miles by rail west of Norfolk, so that the average haul to Tidewater is about 386 miles, from the center of traffic.

The freight rate now applying is \$1.40 per gross ton.

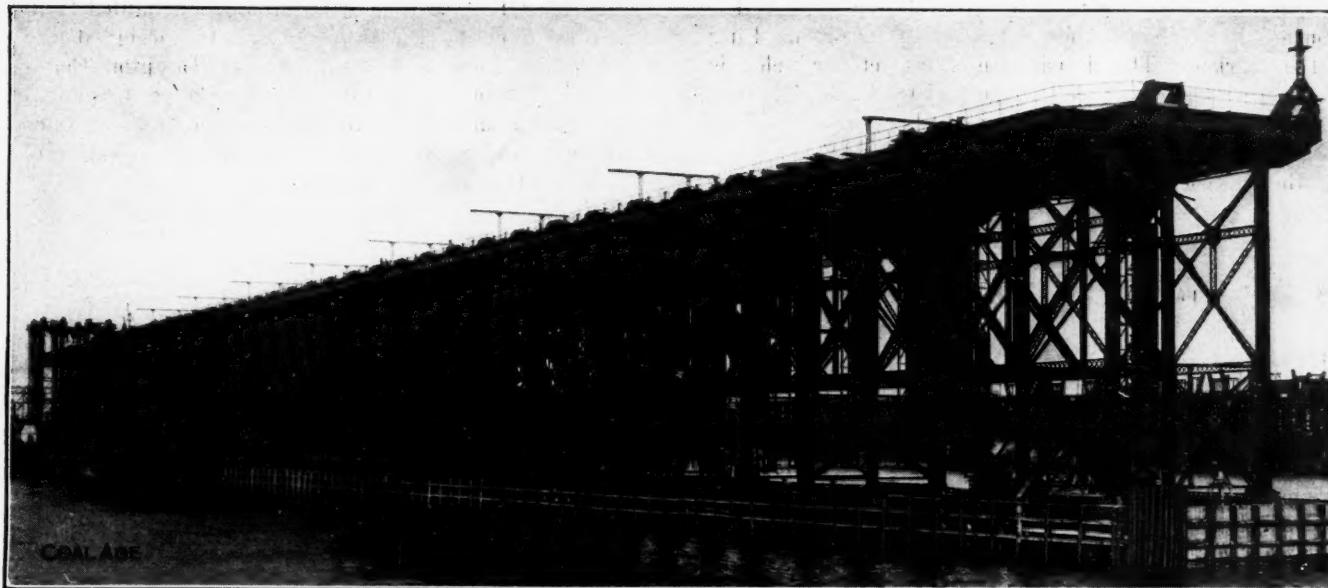
POCAHONTAS					
	Flat Top	Tug River	Thacker	Kenova	Clinch Valley
No. of mines	98	43	42	13	27
Daily capacity	104,225	19,225	20,825	6,475	9,500
Shipments, 1913	15,140,218	2,559,603	3,138,538	977,895	1,858,125
Coal beds and No. mines in each	Pocahontas No. 3 (8) Pocahontas	Davy-Se- well (18) War Creek	Freeburn (18) Thacker (14) War Eagle (14)	Coalburg (3) Thacker (3) Winifrede (5) Alma (2) Warfield (2)	Upper Banner Lower Banner Widow Kennedy, No. 2 Gas (1) Imboden Jawbone Pocahontas No. 4 ( )
Trade names	Pocahontas	Pocahontas	Pond Creek	Thacker W. Va. Splint White Ash, etc.	Toms Creek Clinchfield Raven Red Ash, etc.
No. of selling agencies and general uses of coal	22 Steam Coking Domestic	20 Steam Coking Domestic	18 Steam Gas Domestic Furnaces	8 Steam Domestic Furnaces,	10 Steam Coking Gas Domestic

#### CHESAPEAKE & OHIO

	<b>New River</b>	<b>Kentucky</b>	<b>Kanawha</b>
No. of mines	105	1,592,525	167
Daily capacity	50,590	Upper Elkhorn	S,000 (about)
Shipment, 1913	6,187,924	Lower	8,516,562
Coal belts and No. mines in each			
	Sewell (61)	Van Lear	ch. Eagle (18)
	Sire Creek (21)	Coaltown	No. 2 Gas (64)
	Beckley (22)	Auxier	Powellton (8)
	No. 2 Gas (5)	Millard	Winifrede (9)
	No. 5 Block (3)	Elswick	Coalburg (25)
			Cedar Grove (9)
			Stockton (10)
Trade names	New River	Elkhorn	No. 5 Block (8)
	Gauley Mtn.	Millers Creek	Kanawha Splint
	Gauley	and others	Kanawha Gas
No. of selling agencies	15	15+	Island Creek
General uses of coal	Steam	Steam	Cabin Creek
	Coking	Coking	and numerous
	Gas	Gas	others
	Domestic	Domestic	8+
		Furnaces	
		Kiln	

## VIRGINIAN RAILWAY

No. of mines	62
Daily capacity	26,000 (about)
Shipments, 1913	4,555,531
Coal beds and No. of mines in each	
Trade names of coals	
No. of selling agencies	
General uses of coals	



THE NEW STEEL PIER OF THE C. &amp; O. RY.

on all coal from the Pocahontas fields, destined to points outside of the limits of Chesapeake Bay. This is the lowest rates in existence, on any commodity, being only 3.7 mills per ton-mile. On the high volatile coals from the Thacker Field, the rate per gross ton is \$1.50.

#### NORFOLK & WESTERN TERMINALS AT HAMPTON ROADS

**Yards**—The Lamberts Point Yards contain 52.5 miles of track altogether; the receiving yard will hold 3300 cars of coal, No. 3 pier yard 60 cars, and the No. 4 pier yard 400 cars. There is also a yard for empty cars at the new pier with capacity of 400, and a separate coke car yard holding 130 cars.

**Coal Piers**—This road now has three piers at Lamberts Point, 17 miles from the ocean, with an hourly capacity of 6800 tons, No. 1 pier having been torn down to make room for the new No. 4 pier.

Pier No. 4 put in operation this year, is one of the two largest in the world, and has already made some notable records in loading ships. Until the completion of the new C. & O. coal pier at Newport News, it had the greatest handling capacity and was the largest in the world, 1200 ft. long, 90 ft. above low water, 32 ft. of water alongside, and 30 ft. wide at the water end. It has a handling capacity of 4500 tons per hour into ships, from four to six of which can be coaled at one time. This pier has loaded 3826 tons into a ship in two hours and a half, 7500 tons in four hours and ten minutes and 42,000 tons in twenty hours.

The car to be unloaded is dropped from the pier classification yard by gravity to the car-dumper incline, first going over the scales; here a barney and rope haulage takes it to the dumping cradle of one of the two car dumpers. It is then turned over, dumping the coal bodily into a pier or transfer car, each of which holds 110 tons; the transfer car is then run on the elevators and lifted straight up to the floor of the coal pier, where it is run by its own power (electric) over the pockets into which the coal is discharged through bottom doors, operated by air. There are 62 pockets, each with a telescopic movable chute, down which the coal goes to the ship's hold.

**Coal Mines**—The coal operations on the Norfolk &

Western are divided by the railway company into five fields, as follows:

Field	Daily Capacity	No. of Mines	Kind of coal	Commercial Shipments, 1913
Pocahontas Flat Top	104,225	99	Semi-bituminous	13,925,397
Tug River	19,225	43	Semi-bituminous	2,075,342
Thacker	20,825	42	Bituminous	2,189,422
Kenova	6,475	12	Bituminous	818,147
Clinch Valley	9,500	27	Bituminous	1,708,951

The shipments over the N. & W. coal piers at Hampton Roads are made up of coals from all these fields, with the exception of the Kenova, but over 90 per cent. comes from the Pocahontas and Tug River Field, all sold under the trade name of Pocahontas.

#### Recent Legal Decisions

**Effect of West Virginia Mine Foreman Law**—The provisions of the West Virginia Mine Foreman Law do not exonerate operators from the duty of using a reasonable degree of care to provide safe and suitable appliances for use by their miners. (West Virginia Supreme Court of Appeals, Cheeks vs. Virginia-Pocahontas Coal Co., 82 Southeastern Reporter 756.)

**Discrimination in Furnishing Freight Cars**—The distribution of coal cars to shippers, including cars owned by the shippers and those used by a railway company for its own fuel, in interstate commerce, is a matter involving preference and discrimination, and one for investigation by the Interstate Commerce Commission. (United States Supreme Court, Texas & Pacific Ry. Co. vs. Abilene Cotton Oil Co., 27 Supreme Court Reporter 350.)

**Lien for Price of Mining Machinery**—A manufacturing company which sold mining machinery to a coal company, under an agreement that title should remain in the manufacturing company until payment of the price, by failing to record the contract does not lose rights to retake the machinery, as against a lien for rent or royalties claimed by the owner of the land on which the machinery was installed. (United States District Court, Northern District of West Virginia; Jeffrey Mfg. Co. vs. Mound Coal Co.; 215 Federal Reporter 222.)

**When Oral Contracts Are Enforceable**—The Statute of Frauds, under which contracts not to be performed within the space of one year are made unenforceable unless evidenced by a written memorandum signed by the party to be bound thereby, does not invalidate an oral contract to cut mine props and ties from a tract of land, although the contractor contemplates that more than a year will be consumed in the work, if the contract can be performed in less than a year, and if no time is specified in the agreement. (McClanahan vs. Otto-Marmet Coal & Mining Co., 82 Southeastern Reporter 752.)

# The Conservation of Anthracite Coal

BY R. V. NORRIS\*

**SYNOPSIS**—The writer shows how anthracite coal is being conserved in its extraction, preparation and colliery use. The degradation of sizes in the retail yards may increase the amount of pea, buckwheat and dust as much as 10 per cent.

Conservation is such a use of a natural product that the largest proportion commercially possible may ultimately be available. It certainly is not the locking up of all such material for the use of future generations. Anthracite coal, because of its limited quantity, particularly requires conservation methods in its exploitation, and such methods are properly classified into: Mining, preparation, power production and marketing:

## MINING METHODS

The two general factors modifying conservation in mining are the minimum thickness of the bed mined and the percentage of recovery:

### THICKNESS OF BED MINED

In deciding which beds are and which are not mineable, we face, at once, the question of profitable operation, and it may be conceded that other things being equal, beds which are 6 ft. and over in thickness are more cheaply mined than those which are thinner. If we eliminate all variations other than cutting and loading in making our calculations, the relative cost of mining for varying thicknesses is a matter of simple calculation.

Let

$a$  = Allowance for rock in cents per inch per yard;  
 $h$  = Normal required thickness, in inches, on which allowance is based;  
 $x$  = Thickness of coal, in inches, as measured for allowance;  
 $x^1$  = Net thickness of coal, in inches;  
 $f$  = Capacity of mine car, cubic feet;  
 $w$  = Width of chamber in feet;  
 $s$  = Thickness, in inches, which will give one mine car per yard of chamber. Assume loose coal occupies  $1\frac{1}{2}$  times the volume of an equal weight of solid;  
 $c$  = Cents per car allowance;  
 $m$  = Mining price per car, no allowance.

Then

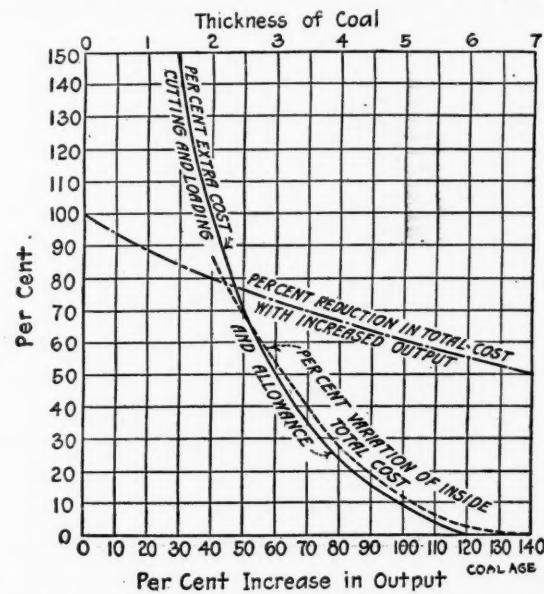
$$\begin{aligned}
 (h - x) a &= \text{Allowance per yard of chamber;} \\
 f &= \frac{3 w s}{12} \times 1\frac{1}{2} \therefore s = \frac{8 f x^1}{3 w s} = \text{Number cars per yard of chamber width;} \\
 c &= \frac{(h - x) a}{s} = \frac{h a - a s x}{s} = \frac{h a - a s x}{x^1} = \frac{h a}{x^1} - \frac{a s x}{x^1}.
 \end{aligned}$$

From this, for any particular conditions, the cost for each thickness may be calculated, and a curve constructed showing the relation between cost and thickness, as shown in diagram.

Unfortunately, all the costs which vary with the thickness of bed are not susceptible to calculation, but in general the inside costs increase rapidly with the mining of thinner coal, and the diagram showing the variation of cost with thickness is believed to represent fairly the average conditions in this district. It was constructed by

plotting a large number of actual costs and then drawing the average curve.

We find ourselves facing the dilemma whether we shall mine the coal which is profitable in itself or a mixture of profitable and unprofitable coal which, through the preponderance of the latter, will result in a profitable output. Our first thought would naturally be that only the coal which is actually profitable should be mined, but when we make a more complete inquiry we find another condition in the relation of output to cost. As but approximately one-third of the inside cost is expended in actual cutting and loading, and as the greater part of the outside cost is but slightly dependent upon output, the cost per ton will be found to vary greatly with the coal production, even with a fixed unit cost for cutting and loading. How great this variation may be is indicated on the diagram, and it is apparent that a large output



### RELATION OF THICKNESS AND OUTPUT TO COST OF COAL

from beds which show a relatively high mining cost may be actually more profitable than a much smaller output exclusively from the larger and cheaper beds.

Hence, it is apparent that, even from the standpoint of immediate profit, it may be advisable to mine the thinner beds with the thicker, and considering the ultimate yield of a property, there can be no question as to the advisability of such a course. The actual minimum mineable thickness being dependent upon so many conditions is not susceptible to general determination and should be studied for each individual case.

### PILLAR SIZES AND DISTRIBUTION

The general method of mining in the anthracite region is by room and pillar, with modifications adapting it to the mine conditions or too often to the idiosyncrasies of the superintendent or foreman. The early mining was done largely by haphazard, leaving irregular chambers and pillars with the result that squeezes were frequent,

Note—Article read before the Engineering Society of Northeastern Pennsylvania, Oct. 15, 1914.

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extensive and disastrous. It is evident that if a given percentage of regularly distributed pillar is required to support overlying strata, the same or even a much greater percentage irregularly distributed may fail to accomplish the result.

Therefore, in chamber and pillar mining, a regular distribution of pillars is essential, involving the careful layout of the workings and the driving of all chambers on line. Further, to obtain the greatest ultimate output, the first mining must be planned so as to leave pillars of sufficient strength to assure support to the overlying strata until second mining can be prosecuted. Under normal conditions the pillar width for first mining may be calculated by Bunting's formula, which, transposed, gives:

$$p^2 + \left( \frac{2}{3} T - \frac{DT}{300} \right) p = \frac{CDT}{300}$$

where  $p$  = pillar width;  $C$  = chamber width;  $T$  = total thickness of bed;  $D$  = depth.

The advantage of carefully projected mining over excavation by hit-or-miss methods is shown in the increase of yield from former performances, in which the output averaged was less than 50 per cent. The maximum extraction was only 65 per cent. on first mining. Under old methods there was but little hope of appreciable recovery from second mining and the percentage accepted in February, 1913, for the estimation of assessment values, ranged for flat measures under 500 ft. deep from 79 per cent., where the coal measure was less than 6 ft. thick down to 65 per cent. where the bed was as much as 30 ft. in thickness.

#### REMOVAL OF BEDS IN ORDER

While the mining was largely in individual hands, each operator desiring the greatest possible immediate return, no attention was paid to the order in which beds were mined. The larger or more accessible beds were opened, mined and caved without regard to overlying coal, with the result of injuring, and in some cases irretrievably ruining overlying beds relatively close to those mined, and often seriously cracking beds even more distant.

It is now a recognized principle that overlying coal should be fully removed before second mining is started beneath it, and present knowledge would indicate that first and second mining should follow each other as rapidly as possible to avoid the deterioration of timber and the loss of coal from spalling, as well as to minimize the cost of reopening the workings and relaying the track.

#### USE OF SHAFT AND CHECK PILLARS

Modern mining systems laid out to obtain the greatest ultimate yield include provisions for the safety of mine openings and the localization of troubles, such as ample shaft support and the now usual provision of check pillars left throughout a property. Every tenth or twelfth chamber is omitted for the purpose of localizing any difficulty and avoiding the old-time extensive squeezes. Further, safety pillars are now usually left beside and under important openings, such as tunnels and slopes. As all this coal is ultimately gained in second mining, such safety provisions are true conservation and operate materially to increase the ultimate yield.

#### FLUSHING

While culm flushing has been thus far utilized primarily for support, or rather to prevent the disintegration

of pillars, the practice will unquestionably result in larger ultimate yields, and will minimize damage to the surface and to overlying beds by decreasing the settlement from the removal of coal. Further, sand flushing appears to promise excellent support, and its use, hardly warranted by the present small margin of profit, should result in the recovery of much coal not at present considered available.

#### MINING FROM UNDERLYING BEDS

Where beds are relatively close together, it is often found practicable to remove the overlying bed through rock holes from the underlying, decreasing the development expenses, halving the cost of maintaining gangways and increasing the ultimate yield.

This is particularly effective in the steep-pitching measures and large beds of the southern field. The Lehigh Coal & Navigation Co. is now recovering stupendous amounts of coal in the Panther Creek Basin in the Mammoth bed, which is here standing vertical and 60 ft. thick, by driving gangways in the underlying Skidmore, and opening in a bottom split of the Mammoth, which was disregarded in first mining. This method was detailed in W. G. Whildin's paper, on "Steep-Pitch Mining," which was read at the Pottsville meeting of the Anthracite Section of the A. I. M. E. He reports that by present methods a yield of 65 per cent. of the total contents is obtained against less than 40 per cent. under older systems.

Similar methods in mining the Mammoth bed in the Shenandoah basin have disclosed the fact that in the original mining, to avoid annoyance from an insufficient pitch, the chambers were driven so as to leave, near the gangway, half or more of the coal in the top and at the top of the chambers as much or more in the bottom. Actually, over 50 per cent. of the present output of the William Penn colliery is from such workings in the Mammoth, the coal coming almost entirely from areas in which second mining had been considered completed and which were marked as exhausted on the old maps.

#### USE OF UNDERCUTTING MACHINE

Within the last two or three years, extensive experiments have been made in the use of undercutting machines, especially in thin beds in the Lackawanna field, and the results give bright promise of economies sufficient to warrant the mining of beds too thin to be workable at a profit under present methods. Under average conditions, it is at present usually unprofitable to mine less than 2 ft. 8 in. to 3 ft. of coal by itself, though thinner beds are occasionally mined to increase output and thus lessen fixed charges, and in this way may actually be profitable, though if bearing their full share of such charges they show a loss.

Further, the use of undercutting machines should result in a larger percentage of prepared sizes, thus increasing the average return and permitting greater cost in mining. The employment of mining machines also leads to the adoption of modified longwall methods promising an increased ultimate percentage of removal.

#### GENERAL OBSERVATIONS ON MINING

The details of improved mining methods and of possible further improvement might be extended almost indefinitely, including such items as improved transporta-

tion, the use of steel and concrete for roof support, the consolidation of pumping and hoisting operations, and the better laying out of development aided by extensive bore-hole exploration of difficult territory in advance of actual mining. As every saving in cost permits a higher cost of actual mining, the result of such improvements must be the recovery of larger percentages of the coal in the ground.

#### PREPARATION

From the hand breaking and fluke roll of the sixties, with the rejection of all small coal, to the present perfection of economical preparation is a wide step, resulting in not only saving fully 30 per cent. of the coal which was formerly rejected on account of size, but in making possible the mining and sale of coal from the impure beds, which is of such a character from stratification with impurities that its preparation for market was impossible even twenty-five years ago.

#### SCREENS

Among the breaker improvements tending to a greater recovery may be mentioned screens; first, round, which were inefficient on sizes below  $1\frac{1}{4}$ -in. mesh, then the Coxe gyrating screen, which, on larger sizes, is today the most economical, but which presents inherent structural and operative difficulties preventing its general adoption, and now the shaking screen at its maximum development. Whether the ultimate in screening has been reached, the future only will show, but, personally, I believe that, in future, better methods, minimizing the present attrition, will be found.

#### SLATE PICKERS AND JIGS

In removing impurities the advance has been even more marked than in screening practice. From the hand-picking of a short generation ago, has developed the various dry pickers adapted to certain classes of coal and the jigs, also due for their first introduction to that pioneer in preparation, Eckley B. Coxe. The lines of future advance appear to be more in the line of perfection of details and reduction of attrition losses than in new principles, though there are still possibilities in a steady upward current of water, which has proved most efficient in copper practice.

#### BREAKING

Perhaps the greatest advance in conservation in the preparing of coal has been in the breaking of the mineral. When the demand was sufficient for lump and larger sizes, the economy of rolls was relatively unimportant, but as the market conditions have changed, so that fine sizes of anthracite now replace the more costly lump, steamer and broken coal, the necessity has developed for breaking down all large coal to relatively small sizes.

A realization of the great losses formerly involved in the use of rolls of convenient sizes with poorly placed and dull teeth, resulted first in the more scientific placing of teeth and the design of separate rolls suitable for the work required of each. Then it was realized that the losses due to dull teeth were important and unnecessary. Later a study was made of the effect of speed on economy in crushing. A reduction of the peripheral speed of the rolls from about 950 ft. per min., the usual practice, to 250 ft., is shown by Paul Sterling, *Trans. American Institute of Mining Engineers*, Vol. 42, p. 286, to have re-

duced the percentage of pea and under, made in crushing lump coal from 20 per cent. to 12, a saving in this one item of 40 per cent. of the loss in fines.

One further factor remains to be studied in crushing practice, the diameter of the rolls. This is a difficult and costly matter to determine and has not thus far been scientifically considered, but it seems probable that there should be a particular diameter of roll best suited to each size of coal and it would appear that investigation on this factor in coal crushing would result in an increase of efficiency.

#### BREAKER CONSTRUCTION

Further economies have been and can be made in the handling of coal in the breakers. Drops can be reduced, the speed of sliding decreased so as to reduce losses by impact. The handling, particularly of large-sized coal, can be largely avoided.

The breakage in elevators is greater than in conveyors, due to necessary attrition and impact in loading and discharge. Slow-moving belts are ideal, but the high-speed belts, such as are usually installed, probably cause more loss in breakage from the impact of delivery than they save because of the more gentle loading and carrying.

#### LOADING

In car loading, the installation of tilting box-car loaders unquestionably reduces breakage, while the conveyor loaders throwing coal to the ends of the car increase it.

#### BONE

Further, modern practice has made possible the mechanical cleaning of coal and the elimination of the slate almost entirely thereby. Thus, anthracite as delivered to the market is free from impurity, though containing most of the coal content of the boney layers. Instead of crushing the bone or actually rejecting it, it is now cleaned of its impurities and this has added materially to the ultimate yield.

#### POWER PRODUCTION

The percentage of the whole coal mined which is used as fuel at the collieries has risen within the last 25 years from about 5 per cent. to a present average of nearly 12 per cent. of the shipments. The extension and increasing depth of the mining operations would have caused a larger increase in consumption than has taken place had it not been for the introduction of improvements in practice.

#### BOILERS

In the early eighties, practically all boilers were of the cylinder type, evaporating as an average not over 6 lb. of water per pound of combustible, and burning pea and No. 1 buckwheat coal. At present nearly all are of tubular type, evaporating 9 to 10 lb. of water per pound of combustible, and usually burning the finest sizes of coal mixed with ground breaker refuse.

#### ENGINES

The engines used at that time were all of the plain slide-valve type, taking steam throughout the stroke and using on the average over 60 lb. of steam per hp.-hr., and in some cases as much as 135 lb. Today high-grade engines for continuous work are the rule rather than the exception, and in these the steam consumption has been

reduced nearly to 30 lb. per hp.-hr. In hoisting engines, while steam economy has not progressed as far, owing to the necessity for absolute control and for rapid starting and stopping, great improvements have been made in designing engines with ample valve area, and with cylinders properly proportioned to their work, but there is still opportunity for economy in the introduction of compound condensing hoists, at least in the deeper shafts, as has been done under the impetus of costly fuel in our Western states.

#### PUMPS

The greatest improvement in steam consumption has, however, been in the pumping plants. The simple direct-acting pumps designed for low steam pressure have been replaced by multiple-expansion engines. These are, in many cases, condensing and designed for high steam pressure. As a result the steam consumption is reduced from an average of over 70 lb. to 20 and in some notable examples to as low as 14 lb. per hp.-hr.

#### PIPE COVERING

The covering of steam lines, too, has removed a tremendous loss, which, in a single colliery examined some years ago, would have aggregated nearly 400,000 lb. of steam in each 24 hr. As a result, 1330 b.h.p., which would have been required had the pipes been uncovered, was not needed. This saving was almost equal to the 1366 hp. actually in use.

#### ELECTRICITY

The substitution of electric for steam and animal power, particularly for haulage and pumping, has also resulted in great economies, and the present trend toward central generating stations with the highest grade of machinery, will further help balance the fuel consumption of collieries, which is necessarily increasing steadily.

#### DRAINAGE TUNNELS

Beside the improvements in pumping machinery, much fuel has been saved by the driving of drainage tunnels, such as the Jeddo and Beaver Meadow, and that of the Lehigh Coal & Navigation Co.; these, beside freeing the collieries from the danger of flooding, save much fuel, which would otherwise be required to actuate the pumps.

#### MARKETING

In the transportation from the mines to the market, the carriage itself is beyond reproach. Careful tests made some years ago absolutely failed to show any breakage in the car itself. On the other hand, the handling of the retailer is about the worst example of inefficiency conceivable.

Beginning at the terminal, coal is generally dumped directly from the car into pockets, with a vertical drop of many feet. From these it is drawn by chutes extending over barges, into which it falls, making a clear drop often averaging 20 ft. or more. Then it is removed in grab buckets, hoisted into a tower, dropped into cars or onto a belt conveyor, dropped again vertically into further pockets or onto piles; finally it is drawn under pressure into wagons and dropped into the consumer's cellar.

At each of these brutal transfers, screening is required and the resultant screenings are sold at a low price as "pea and dust." All this unscientific handling adds to the cost

to the consumer without advantage to anyone. Tests have shown average loss in passing through pockets and into boats of 10 per cent. of egg coal converted into pea and under.

#### STORAGE PLANTS AND MECHANICAL HANDLING

In contrast to this, witness the losses in properly designed storage plants, which, on prepared coal in three large plants, averaged but 2.84 per cent. converted into pea and under, and the excellent handling in places in New York harbor, where, by the use of McMyler car dumpers and telescoping chutes, coal is transferred from cars to boats with but slight deterioration in size.

#### RETAIL YARDS

In general, the point in marketing toward which attention from the standpoint of conservation should be directed, is the handling by the retail dealers. Some of the wholesalers also break and otherwise reduce the sizes of the coal unnecessarily, in their yards. It is in the distributing yards that one of the greatest and most easily avoidable losses in the business is found.

#### CONCLUSIONS

In the above an attempt has been made to outline the improvements made and to indicate possible future developments tending to reduce the waste and thereby conserve coal resources. But this paper would be not merely incomplete but unjust, did it fail to call attention to the wonderful conservation now being practiced by the great coal companies, in mining all possible coal almost regardless of present profits and in endeavoring to attain the ultimate possible output from the lands entrusted to their charge. Furthermore, they have made persistent efforts for the larger conservation of human life and have sought diligently to take from coal mining the stigma of being one of the hazardous occupations.

XX

#### Coal Docks on Lake Erie

Appended herewith is a table of coal docks at lower Lake ports, giving the name of the port, the name of the railroad owning the dock, the type of machine used in loading coal aboard vessels, together with the capacity of the machine per hour. The information contained in the table was obtained direct from the operators and is accurate and up-to-date.

Port	Railroad	Capacity*
Erie <sup>1</sup> .....	Pennsylvania Co.	25
Erie <sup>2</sup> .....	Pennsylvania R.R.	30
Conneaut <sup>2</sup> .....	B. & L. E.	14
Ashtabula Harbor <sup>2</sup> .....	Pennsylvania Co.	32
Ashtabula Harbor <sup>2</sup> .....	Pennsylvania Co.	30
Ashtabula Harbor <sup>2</sup> .....	L. S. & M. S.	20
Ashtabula Harbor <sup>2</sup> .....	L. S. & M. S.	20
Fairport <sup>2</sup> .....	B. & O.	25
Cleveland <sup>1</sup> .....	Pennsylvania Co.	30
Cleveland <sup>2</sup> .....	Pennsylvania Co.	20
Cleveland <sup>2</sup> .....	Pennsylvania R.R.	20
Cleveland <sup>1</sup> .....	Erie R.R.	20
Cleveland <sup>2</sup> .....	W. & L. E.	20
Lorain <sup>2</sup> .....	B. & O.	10
Lorain <sup>2</sup> .....	B. & O.	20
Huron <sup>2</sup> .....	W. & L. E.	20
Huron <sup>2</sup> .....	W. & L. E.	20
Sandusky <sup>2</sup> .....	C. C. C. & St. L.	1
Sandusky <sup>2</sup> .....	B. & O.	3
Sandusky <sup>2</sup> .....	Pennsylvania Co.	24
Sandusky <sup>1</sup> .....	Pennsylvania Co.	30 to 40
Toledo <sup>1</sup> .....	Hocking Valley R.R.	40
Toledo <sup>2</sup> .....	Toledo & Ohio Central R.R.	20
Toledo <sup>2</sup> .....	C. H. & D. Ry.	30
Toledo <sup>2</sup> .....	W. & L. E.	6

<sup>1</sup>Wellman-Seaver-Morgan machine. <sup>2</sup>McMyler machine. <sup>3</sup>Excelsior machine. <sup>4</sup>Two Brown Hoists of 40 cars capacity each.

\*In railroad cars per hour.  
Note—From the "Marine Review."

## Power Department

### The Coal-Mine Power Plant

SPECIAL CORRESPONDENCE

**SYNOPSIS**—*In coal mining, the power plant is frequently grossly neglected. It is in reality the main-spring of the whole coal-producing equipment and no pains nor means should be spared to render it as reliable as possible.*

Much attention has been given during recent years to the application of electricity to colliery purposes. Efforts have been put forth by electrical manufacturers toward securing apparatus which should be as far as possible mistake proof, and at the same time rugged, simple and especially designed to withstand the neglect and rough handling inherent to operation underground. Simultaneously, progress has been made in the education of men employed in the mine regarding the proper use of electrical apparatus and the dangers attendant upon carelessness or misuse. As a result, much of the prejudice which at first existed with reference to the employment of electricity in mining operations has disappeared.

Attention should now, however, be drawn to a matter which may well become of greater and greater importance as electricity becomes more extensively used. This is the question of the power house, which supplies the energy to the colliery.

This may at first sight appear to warrant no great consideration. It is usually, however, the matter which is passed over as being too simple for comment, which affords the opportunity for trouble, and the mining power plant at the present time occupies for the most part a rather dangerous position.

At the beginning of electrical application, a small plant sufficed for the needs of the colliery, and an installation of this description could be attended by a comparatively small staff, who possessed no great experience. Today, however, a gradual process of extension in electrical application is going on in most mining developments involving an increase in the size and output of the power units. Conjointly, there is a distinct tendency to connect more than one mine onto a general system supplied from the main generating station.

This brings about some important changes in conditions. The power station is greatly increased in size and usually in complexity, with the result that unless great care is taken to standardize equipment and simplify operations, as the use of electric power increases the problem of supervision becomes considerable, with the result that a man possessed of a much higher order of technical knowledge and experience is required therefor than was formerly the case.

In many instances, especially where several mines are connected to one power house, due to heavy transmission losses incident to the use of direct current a change of the method of distribution to polyphase alternating current is being made, and for the operation of this latter much technical knowledge is necessary.

### CONTINUITY OF SERVICE IS IMPORTANT

In installations which supply light, heat and power to industrial communities, it is readily recognized that the supervision and operation must be of a highly skilled nature. Colliery plants as a rule are smaller in output than the average power plant for a community, and there is a tendency to cheapen the cost of operation by utilizing services of men who may not have the same technical qualifications.

It is at once apparent that it is important to maintain continuity of supply on an industrial lighting and power circuit. It is, however, even more important to maintain continuity and reliability in a colliery plant, even though its size may be smaller and its operation local, because much depends on such continuity.

It is not necessary to elaborate on the serious consequences, both as regards life and property, which might be involved in an undue stoppage of a ventilating fan. The mine output is also vitally affected by the continuity of power supply, for at the present time when electric coal cutters and locomotives, electrically operated screens and washing plants are the order of the day, failure of power supply at any point involves dislocation of the work, a reduction of efficiency, and the loss of output.

To accomplish continuity of supply, two main factors are essential. The first is reliable equipment in the power house simplified as far as possible, and standardized to the utmost limit so as to reduce the difficulty of supervision to a minimum. The second is due provision for an adequate staff possessed of a proper degree of technical knowledge working under conditions promoting bodily health and mental clearness.

It is not proposed to here consider examples where such conditions are not fulfilled, although it would be by no means a difficult stretch of the imagination to believe that some colliery plants do not wholly measure up to these requirements. It may, however, be pointed out that a mining power plant should be designed with liberal ground space and due provision for systematic extension both as regards boilers, engines and electrical machinery.

### THE SWITCHBOARD IS AN IMPORTANT ELEMENT

As a rule, the chief danger arises at the switchboard. An equipment of this kind designed on the principle of standard panels, properly safeguarded at the front, and so wired that any switchboard attendant can, either by reference to a wiring diagram or by a quick inspection of the connections at the rear of the board ascertain the course of the current at any time is the one to be preferred.

The switchboard should be capable of being easily kept clean without danger at any time and due space should be provided both in front of and behind it to allow an attendant to work in a perfectly uncramped manner.

In reality, the switchboard is the pivoting point of the whole station, because here the entire power output is concentrated and from this point it is distributed. Consequently, no reasonable expense should be spared in making it both safe and convenient. Above all, no portion of a switchboard or any switching apparatus about the power house which has been erected in a temporary manner should be allowed to become permanent. This remark applies with equal force to cables connecting the various parts of the electrical apparatus.

One of the most important objects to be kept in view in designing a mining power plant is the comfort of the employees. This is not urged from any philanthropic or humanitarian motive, but simply as a matter affecting the reliability of power supply. The chief dangers are insufficient light, undue heat, awkward corners, cramped conditions, and waste products.

The power house which has dark places and corners invites break-downs. It is impossible to maintain the requisite amount of cleanliness and safety when the only possible way of thoroughly examining the plant is by the light of a portable torch. This condition leads naturally to leaks of steam and hot water in the piping, and to loose screws, bad insulation and other troubles in the electrical equipment.

Light is essential to observation and maintenance and the management has only itself to blame if the plant fails owing to bad design from this cause. Moreover, darkness conceals filth and dirt which whether found in a deposit of dust on bearings, or a greasy film on electric contacts and insulators are the forerunners of more or less serious disaster.

#### A HIGH TEMPERATURE SHOULD BE AVOIDED

A common fault in power houses, particularly those operated by steam, is the prevalence of too high a temperature, both in the boiler house and engine room. This has a bad effect not only upon the insulation but the electrical output as well. It is even more marked in its effect on the condition of the operating staff. No man can work properly when placed under conditions where he continually feels limp. Under such circumstances supervision is relaxed and there is a tendency to shirk. Jobs that ought to be done are put off indefinitely with the result that repairs are not executed until they become unduly costly.

Parsimony in proper ventilation is paid for by increased maintenance cost and the highest grade of workman regardless of whether he be a fireman, engine driver or switchboard operator, will not long remain in places where he is subjected to a maximum amount of discomfort. The result of all this is that the only men available for continuous employment in badly designed stations, are those that are the least competent to operate the machinery.

A due consideration of the comfort of employees means that better attention is paid to apparatus, and breakdowns are minimized. If the apparatus is so arranged that it can only be attended to by a vast amount of running about for the inspection of meters, steam and water gages and the like, it is practically certain that something will be neglected. For this reason awkward corners and inconvenient levels should be avoided, and gages as far as possible be brought as near as local conditions will permit to the eye level of the attendant.

A power plant which can only be operated by climbing over or crawling under pipe work, or threading a precarious trail, past festoons of temporary cable, is not only a death trap to the men operating it, but may be the cause of various disasters among those in the mine who are dependent upon a continuous and efficient supply of electrical power.

#### CAREFUL PROVISION FOR WASTE DISPOSAL

An item which is often overlooked in power plants, particularly those of medium size, which cannot indulge in elaborate systems of fuel and ash conveyors, is that of the proper disposal of waste products from the boilers. The result of neglect, particularly if the plant is undermanned, is that accumulations of clinkers and ash are found on the boiler-house floor, impeding the work of the firemen, providing a good distributing center for pernicious dust and dirt throughout the building and heating an already uncomfortable atmosphere.

If wheelbarrows have to be employed to get rid of the ashes, the track to the dump should be wide and direct and not too long. Due provision in the shape of man power should be made to get rid of the ashes as quickly as possible after they are drawn from the furnaces. A fireman cannot work properly if he has to contend with an uneven floor, and crumbling masses of clinker.

Other points could be enumerated which result from conditions attendant upon mismanagement of even such medium-sized plants as are required at coal mines. The above, however, may suffice to draw attention to the fact that because a plant is situated upon the surface and not in the heart of the mine, it must not therefore be treated with disrespect. Such a plant is the central point upon which the whole operation of an electrically driven mine depends, and sufficient care should be taken both as regards equipment and working conditions, to insure that no possible chance can be given to breakdowns other than those caused by such gross carelessness that the services of the man responsible therefor may be immediately dispensed with.

Many a man is reasonably efficient under reasonable conditions. Few are sufficient geniuses to guarantee results when proper means for procuring the same are not afforded.

■



ENGINE AND SMALL PASSENGER COACHES USED TO CONVEY THE MEN THREE MILES FROM TIPPLE TO MINE, MILL CREEK COAL AND COKE CO., COOPER, WEST VIRGINIA

# Developing a Sixteen-Inch Coal Seam

BY J. F. K. BROWN\*

**SYNOPSIS**—Description of a small operation managed by one man who is averaging a profit of about 30c. per ton. The methods of mining and handling the coal are unique. Each miner not only cuts his coal, but loads and trams it to the tipple.

The scene of this exploit is in Central New Brunswick, Canada, and its successful operator, a self-taught miner. It is true that he is making only his living out of his efforts, but his methods point the way to future success. Furthermore, he has accomplished what "legions" of American engineers have failed to do.

A section of the seam is shown in Fig. 1. It is generally considered to be in the non-productive Millstone grit, of the Carboniferous system. The overlying stratum averages about 100 ft. in thickness and is made up mainly of a heavy blocky sandstone and beds of shale. One of these beds lies directly over the coal. This shale is impervious to water, and this fact apparently preserves the workings dry.

The coal outcrops in the bed of the river, but being

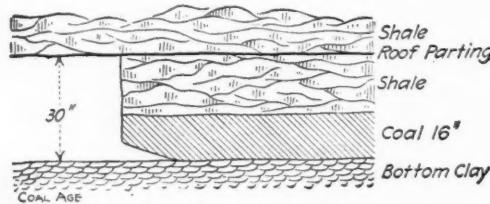


FIG. 1. SHOWING SECTION OF THE COAL SEAM

itself together with the shale weathered by many seasons of frost and rain, the actual outcrop is entirely concealed by vegetation.

Fig. 2 shows the entrance to one of the main levels. At this point the banks of the stream fall roughly from the tableland above in a heavily wooded bluff, at an angle of about 45 degrees, the bed of the stream being about 140 ft. below the seam. A section is shown in Fig. 3.

In working, the main level is driven in on the coal a width of approximately 10 ft., enough to provide a double track if needed. Owing to the shape of the areas, this level was at first driven south and at an angle to the teeth of the coal. At a distance of 300 ft. in, levels are turned at right angles about 30 ft. apart. Thereafter, in the usual American practice, these levels are opened out 20 ft. from the main roadway, to a width of 15 ft., forming a room on one side of the roadway. This is continued for a distance of 30 ft. when the men turn and take 30 ft. out of the other side of the road, narrowing down again when they approach the main roadway. Under this system any pillars that are formed are immediately taken out, and further it has the advantage of operating what is practically a piece of a longwall section in which some area is left to dispose of surplus stone,

## METHOD OF MINING

The height of the actual working is about 30 in. This leaves 14 in. of stone, which must be mined as well as the coal, and sent away. Three cars of stone, more or less, to one of coal is the collier's usual production. The undercutting of the coal takes place above the coal seam. At the parting between the coal and the shale there are a few inches of a finer grained and softer shale, and this is easier to mine than in the coal, besides having the very important advantage of leaving all the coal intact for market purposes.

The miner's picks when used to mine at either the



FIG. 2. LOOKING UP HOISTING TRESTLE.  
ENTRANCE TO LEVEL ON LEFT

bottom or top of the seam soon become blunt in comparison with those used in mining the shale. This appears to be due to the presence of an occasional thin band of iron pyrites which appears at this point. No explosives are used, the coal parts perfectly from the pavement. In working, the shale is mined and taken down first, trammed or filled out of the way. Timber as required is next set, after which the coal is in turn lifted and run outside. The roof would seem to be of a short-break nature, but certain partings if taken and maintained will stand well. Fig. 4 shows a section of the workings at present being operated.

Past operations have never gone very far from the outcrop, with the result that there are a great number of old tunnels dotted along above the bed of the stream wherever the cover has been strong enough to permit working. A little water leaks through from the old areas into the

\*Sydney, N. S., Canada.

present areas. The dip is slight, the field forming what would be termed elsewhere a level field.

#### HANDLING THE MINE WATER

Pumping troubles are avoided by arranging a ditch which is cut to a considerable depth in the center or side of each entry with just enough grade for free water drainage. This, of course, will serve only a limited area, but there is ample fall from the mouth of the mine to the bed of the stream to allow of the use of a siphon which will take care of all the water made in the mine for many years to come. There are also indications that once the present development gets past the limits of the old workings, the mine will in all probability be dry, and it is to be hoped, not too dry.

Up to the present, as all the operations are near the mouth of the level, the miners tram both their coal, and what stone they cannot stow, outside. Here the slope to the bed of the stream forms a convenient dumping ground, and doubtless in the past, many hundreds of tons of shale have been weathered away by the stream, and carried out to the ocean. The coal is trammed in small boxes holding about 700 lb. each. Although these boxes are very small, they are a convenient size, considering the height of the workings. One man can attend to running them out to the surface, and, in case of a de-

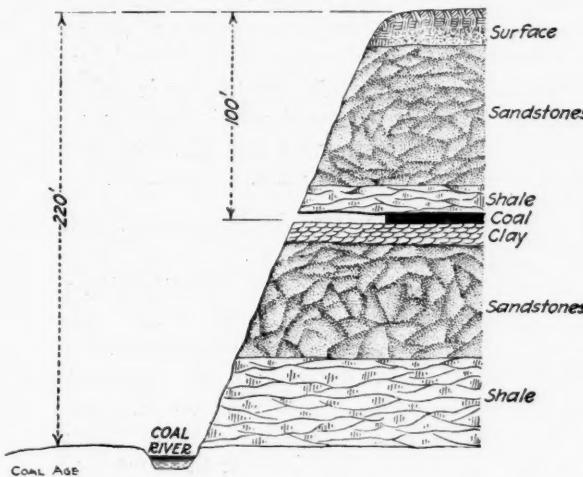


FIG. 3. THE SEAM LIES ABOUT 140 FT. ABOVE THE RIVER

railment, they are easily put back upon the track. Light rails are used and since this steel is placed by men unacquainted with the work, derailments are frequent.

#### HANDLING THE COAL

The coal from the mine is weighed and is then tipped into a two and a half ton hopper truck. An incline laid on a 3-ft. gage rises at an angle of 45 deg. to the top of the river bank, and the truck when full is hoisted to the top by a small steam hoist. At the top, and on the general tableland, a larger storage hopper has been built, and into this the small hopper truck automatically discharges. From here the coal is carried away by wagon a distance of over a thousand yards before it finally reaches the railway siding and is deposited in railway cars.

These would appear to be insurmountable objections to profitable working in other regions, but despite the thin seam, the mining of three boxes of stone to two

of coal, the extra handling of the fuel, and the carting of it by teams, there is a profit on the operation. There are, of course, no pumping costs, no haulage costs, no winding costs, and no ventilation questions.

The quality of the coal is excellent, that is, as measured by the standard of the fuels against which it has to compete. Its ash content is high as compared with American coals, but not as compared with a number of the Canadian seams. A comparative table is given below, the first column being the thin coal:

#### ANALYSIS OF CANADIAN COALS

	Thin Coal	Joggins	Spring- hill	Vale	Drum- mond
Water	4.300	40.89	34.09	1.40	0.72
Volatile matter	31.275	40.89	34.09	28.80	25.73
Fixed carbon	53.175	48.33	54.33	55.30	65.35
Ash	11.250	10.78	11.58	14.50	8.20

In addition, the analyst gives the heat units as 14,148 (Thomson), and says "The coal possesses excellent coking qualities and forms a hard coke, well fused and bright in appearance. The evaporative power of the coal is high and compares favorably with the best Welsh bunkering coals."

The main fault of the seam is its tendency to break in handling, although doubtless this is aggravated by the unnecessary number of times during mining that it is thrown from one conveyance to the other. The price obtained for the coal, while high as compared with the majority of American mines, is actually less than the sum received by the Nova Scotia collieries with their thicker

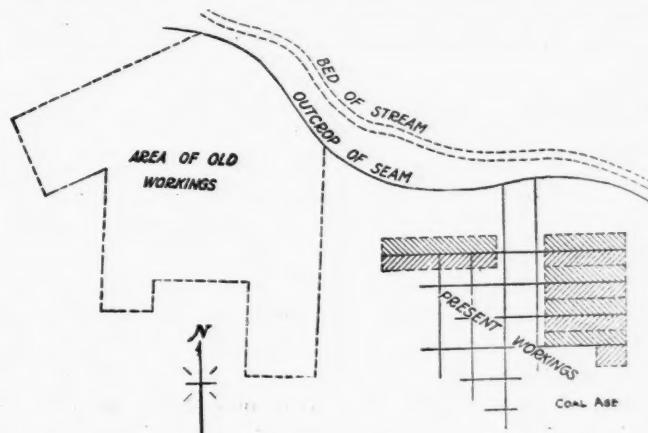


FIG. 4. A SECTION OF THE WORKINGS NOW BEING OPERATED

seams, by approximately 25c. The coal mined from this thin seam sells for \$2.55 per ton on the railway cars.

#### REASONS FOR SUCCESS

While quite a number of little matters have helped to bring about the success of this tiny mine, there are two main reasons, and these are low capital outlay and low supervision costs. That these points are important cannot be denied, but it is a strange thing that other people with more money and better training appear to forget their significance the moment the first sod of a new enterprise is turned.

The wages earned by the men working, none of whom have any knowledge of mining except what they have learned through experience in this coal, average about \$3 per day. In the mine the money is earned on the tonnage put out, and the rate paid is \$1.34 per ton of coal extracted. For this the miner undercuts his coal, takes down the stone, trams it to the dump, sets his

timbers, lifts and gets his coal to the mouth of the mine, an average distance of say 500 ft. Therefore the total mining cost is entirely covered by this extremely modest figure.

#### ADMINISTRATIVE DUTIES

Then come the duties of the management, which start at this point. The management, represented in the singular by the operator himself, weighs the coal, hoists the self-dumping car when full, and attends to all the questions of time and tonnages. When the hopper at the top of the incline is full, cars are called for on the railway line up to the capacity required, and a double team requisitioned; the coal is then carted over to the railroad. This operation costs 25c. per ton.

Timber grows on the estate, at the mouth of the mine in abundance for the requirements of the squad employed. The price paid is 85c. per 100 ft. for 4-in. stuff, and \$1 for 6-in. timbers. The cost of this item approximates 10c. per ton of coal mined.

#### COST OF MINING

Overseeing, weighing, hoisting, clerking and any other odd matters occupy only part of one man's time, and that man in this case is the proprietor. Then there are sundry items, such as lamp oil, lamps, tools and sundry repairs, blacksmith work, and the small amount of supplies required. Altogether the actual cost of getting the coal can, with fair accuracy, be tabulated by one who was on the ground, somewhat as follows:

Mining .....	\$1.34
Timber .....	0.10
Repairing and blacksmith work .....	0.12
Surface trucking to railway spur .....	0.25
Sundry supplies .....	0.13
Overseeing .....	0.30
 Total .....	 \$2.24

We have left about 30c. on the ton, which may be called legitimate profit.

As the photographs will readily show, there has not been much capital expended, and this sum together with the little required for the initial development of the mine, over and above the value of the coal extracted, I estimate at \$2800. Twenty tons a day is the output maintained, and this amount about represents the limits of one man's activities in the direction of attending to all the duties above described. At these figures, however, with increased output, there could be quite a nice little profit.

It is now proposed to equip this small mine with modern mining appliances underground, which will be described at some future date.

The owner also has the further advantage, in that he sells to only one customer, the owner of the leasehold, and so has no bad debts to meet, and only one account to keep. The owner of the lease resells at a profit sufficient to at least cover the government royalty. The operator, therefore, instead of having to pay a royalty, accepts a fixed sum for the coal mined.

While it is agreed that the circumstances are exceptionally favorable to the thin seam working, it must also be agreed, that in this mine the case was made to suit the circumstances. There are no particularly striking innovations in methods of operation, and that being so, the successful initial work is mainly a triumph of common sense.

#### The Labor Situation

The principal development in the labor situation of Ohio during the past week was the movement started in the miners' organization demanding a referendum vote on the proposition of accepting the operators' offer of 44.61c. for machine-mined coal on the mine-run basis in the eastern Ohio district. The local of the union at West Wheeling adopted such a resolution recently and it is said a similar preference was expressed by the miners' union at Glencoe. These actions show the temper of the rank and file of the miners' organization, which is anxious to return to work despite the effort of officials to keep them in line on the strike proposition. So far no efforts have been made to resume the wage-scale conferences. Among the families of the miners in eastern Ohio, there is much suffering reported, which is being relieved by local committees and the Ohio mining department.

#### REBUILDING OF TIPPLES TO CONFORM WITH MINE-RUN LAW

Many of the larger operators in the Hocking Valley district have secured plans and figures on the rebuilding of tipples to conform to the new law but contracts have not yet been made. The market is weak and it is hard to raise money for such rebuilding of equipment. This is especially true of the Sunday Creek Co., where efforts are being made to conform to the decree of the court separating the companies from railroad control by Nov. 4. Until the reorganization is effected, it is believed that nothing will be done toward rebuilding the tipples of the company. It is estimated that the cost to that corporation alone will be \$250,000.

#### GOVERNOR COX PROMISES RESUMPTION AFTER THE ELECTION

Governor Cox in his campaign for reëlection promised that the strike would be ended the day after the coming November election. This statement was made to the idle miners in an effort to secure their votes and to prejudice them against the operators. Just how the strike would be settled he failed to say but inferred that the operators would be glad to give the miners their demands after the election. This statement which was repeated several times roused the ire of some of the operators who object to the governor playing politics in that manner.

In the meantime, the miners' officials are busy securing loans in an effort to finance the strike during the winter months. This is taken to indicate that the miners' officials do not believe the governor's statements, as they would not need to lay plans for securing money if the strike was to end the day following the election.

#### The Royalton Explosion

A gas explosion followed by fire occurred early Oct. 27 in the mine of the Franklin Coal & Coke Co., Royalton, Franklin County, Ill. Shortly before the explosion, 300 men entered the mine; only a cageful of the day force remained on the surface. At the present writing, 47 bodies have been recovered and it is believed that there are now no more left in the workings. More than 80 men taken from the mine living are said to have been overcome by afterdamp, and of these two died at the surface.

## Editorials

### The Mulga Inquest

The prevailing opinion is that an inquest at a mine disaster is a liberal coat of whitewash over a corporational crime. We note nothing so generous in the award of C. L. Spain, the coroner of Jefferson County, Ala., on the Mulga disaster.

He shows that employees most carelessly broke down an important ventilating door, that they did nothing to replace it and that as a result the mine was the scene of a disastrous explosion. But he forgets to censure them.

No! The men are not dead; they killed their fellows by the most wanton folly and, still living, the coroner hesitates to censure them. But he does not hesitate to censure the company's management for failing to call the men out of the mine. Though he omits to declare it, the company officials *may* have known the door was down and would be consequently rightly participants in the charge of carelessness. But why omit the colored men, Lee and Rodgers, in the indictment? Surely a motorman and a trip rider should know the danger of leaving a door open.

The inquest does not whitewash the company, but rather applies the brush liberally to the colored help.

The last clause of the verdict, requiring that every working place be examined three hours before it is entered by the workingman, seems to suggest that there is a doubt in the mind of the jury as to whether the gas accumulation really arose from the broken door or resulted from conditions existing long prior to its destruction. For, as the door was broken only an hour before the explosion, what good would an examination do, however carefully conducted, if made about five hours before the explosion occurred? The disaster happened at 9 a.m., and the examination of the place which exploded should, according to the coroner, have been made not later than 4 a.m., three hours before anyone went to work.

Nevertheless the coroner is right in his recommendation, even if his advocacy of the change throws a doubt on his finding as to the cause of the explosion.

### The British Coal Exports in September

The British coal exports for September show a substantial recovery from the low figures immediately succeeding the first shock of the war in August. The movement in September showed an increase of about one-third over that for August, the respective figures being 4,096,453 tons in September, as compared with 3,209,399 tons during the preceding month. However, the tonnage is still only about two-thirds normal, the September movement in 1913 aggregating 6,501,578 tons. But in view of the unfavorable conditions prevailing in manufacturing circles, this loss is by no means as heavy as might have been expected, particularly since exports to Germany and Austria-Hungary have been cut off entirely.

In the movement to the South American trade, there

has been a particularly heavy decline; for example, the Argentine Republic, which took 267,142 tons in September, 1913, this year only imported 153,016 tons. The respective exports to Brazil during the same periods were 158,896 tons in 1913, and 69,528 tons in 1914. This would seem to present a golden opportunity for the American exporters. But, as a matter of fact, it is highly probable that this reduction in fuel imports is but the inevitable reaction incident to a reduction in South American exports to England. In other words, it is essentially a curtailing in demand rather than any permanent loss of market.

A further interesting phase of the British exports is the enormous increase in tonnage to countries immediately contiguous to Germany. Thus the exports to Denmark increased from 255,724 tons in September, 1913, to 405,842 tons last month. Some three or four other countries show a like heavy increase, and at first glance it would seem that Great Britain apparently is supplying Germany with fuel. As a matter of fact, however, these countries have all been large importers of German coal, and this increase no doubt accounts for the displacement of the German product in these markets.

### "When That I, Deborah, Arose"

The purposes of the present incumbent of the presidency of the United States are animated by the most noble of sentiments. And it is in the fact that the people have such unbounded faith in him as an honest, unimpeachable man that the danger lies. He may, we fear, violate the laws and the spirit of legislation without any protest being raised. We have seen how ready he is to withdraw forces from Colorado, despite the fact that the United States is bound by the constitution to guarantee domestic order in the states.

The fault with Mr. Wilson is that he believes that he and all good men in office should be above the law, but only on Oct. 20 at the meeting of the American Bar Association did he openly declare it. We will quote his words just as they are, and ask the reader to note their occasional faulty construction, and one instance where a slang expression has crept in. We recall to his remembrance that President Wilson normally writes almost perfect English. Few there are who have a more complete command of language. We surmise therefore that the President did not read his address, and so his statements in it might not meet unquestioned his own more careful consideration if he pondered them at his leisure.

What I wanted to suggest to this association is whether we sufficiently apply those same ideas to the municipal law we seek to administer. Citations seem to play so much larger role than principle. There was a time when the thoughtful eye of the judge rested upon the changes of social circumstance and almost palpably saw the law rise out of human life. Have we got to a time when the only way to change law is by statute?

The changing of law by statute seems to me like mending a garment with a patch; whereas law should grow by the

life that is in it, not by the life that is outside it. I should hate to think that the law did not derive its impulse from looking forward rather than from looking backward; or rather that it did not derive its instruction from looking about and seeing what the circumstances of men actually are and what the impulses of justice necessarily are.

Understand me, gentlemen, I am not venturing in this presence to impeach the law. For the present by the force of circumstances I am in part the embodiment of the law, and it would be very awkward to disavow myself. But I do wish to make this intimation, that in this time of world change it is worth while looking inside our municipal law and seeing whether the moral judgments of mankind are made square with every one of the judgments of the law itself.

Public life, like private life, would be a very dull and dry matter if it were not for this belief in the essential beauty of the human spirit and the belief that the human spirit could be translated into action and into ordinance. Not entire. You cannot go any faster than you can advance the average moral judgments of the mass, but you can go, at least, as fast as that, and you can see to it that you do not lag behind the average moral judgments of the mass.

I have in my life dealt with all sorts and conditions of men, and I have found that the flame of moral judgment burned just as bright in the man of humble life and limited experience as in the scholar and the man of affairs. And I would like his voice always to be heard, not as a witness, not as speaking in his own case, but as if he were the voice of men in general, in our courts of justice, as well as the voice of the lawyers, remembering what the law has been.

My hope is that being stirred to the depths by the extraordinary circumstances of the time in which we live we may recover from those depths something of a renewal of that vision of the law with which men may be supposed to have started out in the old days of the oracles, who communed with the intimations of divinity.

President Wilson is a student. He remembers how the Court of Chancery started. Laws were few and did not assure anything resembling equity between man and man. The king therefore took a churchman and left it to his conscience to decide right from wrong wherever the statutes were silent. Gradually precedents arose and the court which was founded at first on private judgment became largely a tribunal with decisions which were dependent on previous rulings and was therefore as reliable as the courts which based their decisions on the statute law.

But the struggle between precedent, which is reliable, and conscience, which is dependent on the point of view of the individual, was long and bitter. Selden died in 1584 and his "Table Talk" shows the attitude toward equity as it was then administered, the chancellors then contrasting themselves boldly with the lawyers and claiming unlimited freedom of moral action.

Equity is a roguish thing. For law we have a measure—know what to trust to; equity is according to the conscience of him that is chancellor, and as that is larger or narrower, so is equity. It is all one as if they should make the standard for the measure we call a foot a chancellor's foot. What an uncertain measure would this be! One chancellor has a long foot, another a short foot, another an indifferent foot; it is the same thing in the chancellor's conscience.

As the equity court was originally created, it would have been utterly foreign to American notions, as also to English, at the time of the American revolution. But as it had evolved into a court based on tangible precedents, and as its pronouncements had been for centuries modified by legislation wherever the conscience of the people opposed the opinion or precedent of the court, it was found not to be at variance with the ideas of a democratic people and was suffered to exist.

But if the court is again to be given a conscience or rather a permission to gage the "moral judgment of the mass" and decide issues on that basis, the end will be as uncertain as the judgments of men or rather, should we say, as the judgments of the judgments of men.

Worse yet will it be if the foundation of our interpretation of the constitution and the laws is to be assailed and we are going to ask, not what the writers meant and what the words actually conveyed when written and approved, but what we think the moral judgment of the public might perchance have them mean today.

Are we to leave to judges and the executive this momentous decision? If so let them write the laws direct without such trifling restrictions. What have the people to do with legislation anyway if the President is to be followed in his erratic yet well meant suggestions?

President Wilson seems tired both of law and of equity. He desires that his judicial appointees, as well as himself, may be to the American people as Moses, Aaron, Deborah and Kun-fu-tse. He would not have them trammelled with statutes or even with precedents. As he says, they will decide as of the "oracles" of God and the "intimations of divinity." In fact, only Deborah who left no precedents behind would truly meet with the approval of Mr. Wilson.

Some such divinity must hedge President Wilson when he, in violation of the provisions of the Constitution, threatens to remove the troops from Colorado, which would have otherwise nothing to do, and proposes to leave the workmen engaged there subject to the ruffianism of the undesirables from the Balkan States. Most of these men have never worked in the Colorado mines, yet they are permitted to destroy the property by which American workingmen desire to acquire a living.

For him we wish another vision and prompting him we hope he will have another prophet than W. B. Wilson of the Department of Labor. We fear that it is the latter voice prejudiced by years of professional agitation which the President regards "as not speaking in his own case but as if he were the voice of men in general."

\* \* \*

### The Necessity for Caution

Firebosses cannot be too careful when going their rounds just previous to the time when the working shift goes on duty. A case which supplies a lesson occurred at a mine in Scotland, where a fireboss met death by an explosion while inspecting the pit. No one living saw the accident, but it transpired that the man had been suffocated by the afterdamp. Near his body was found a safety lamp, together with an ordinary naked pit lamp. The jury found that the explosion had been caused by the presence of the naked light. Other instances have occurred of firebosses taking naked lamps with them on their round of inspection, although it is a contravention of most mine laws. Many explosions have been caused by lights of this description. It is a dangerous as well as a reprehensible practice "when looking for gas."

\* \* \*

Branches of the Northumberland Miners' Association are urging the insertion in the British Coal Mines Act of a clause making it compulsory that every mine shall "rest" for a period of not less than four hours per day, so that the air may be purified. They are of the opinion that the growth of nystagmus is due to the methods which prevent the mines from being cooled and cleaned every day. They also assert that the atmosphere in mines has been made worse by the poisonous fumes arising from high explosives now in use. Some food for thought here.

## Sociological Department

### More West Virginia Gardens

The Elk River Coal & Lumber Co., at Widen, Clay County, W. Va., recently held a garden competition for the miners in the Rich Run mine, with the following result:

First prize for prettiest front yard, B. C. Gallimore, \$10.  
 Second prize for prettiest front yard, Dr. R. H. Eanes, \$5.  
 First prize for best vegetable garden, Louis Buratti, \$10.  
 Second prize for best vegetable garden, T. J. Young, \$5.  
 First prize for neatest and cleanest premises, Harley Booth, \$10.  
 Second prize for neatest and cleanest premises, Frank Nagle, \$5.

First prize for best combination vegetable and flower garden, J. L. Williams, \$10.

The \$10 prizes were equally divided between the tenant and his wife, and the \$5 prizes were awarded to the wives of the tenants. The judges were: R. S. Strickland, J. C. Hiltabidle, J. Swan and J. A. Murphy.

Widen is near the center of West Virginia, at the head of the Buffalo Creek & Gauley R.R., a branch of the Coal & Coke R.R. It is a long way distant from the Weyanoke and Gary mines, the gardens of which have received recognition in these columns.

■

### Testing the Eyesight of Mine Foremen and Firebosses

The eyesight of all mine foremen and firebosses in West Virginia is being tested, so that they will be fully qualified to detect gas in any place in the mines they examine.

An order to this effect was issued a few days ago by Earl A. Henry, chief of the mining department, after a conference with coal operators in various sections of the state. The operators fully approve of Mr. Henry's ideas on the subject, and advised him to issue an order to have them carried out, and they promised their hearty co-operation.

"It is apparent," says Mr. Henry, "that the men charged with the work of making mine examinations should have eyesight as nearly perfect as locomotive engineers, who are required to be able to distinguish the difference in colors of danger signals along the railroads. This is only a matter of taking the necessary precautions to have the mine foremen and firebosses fully qualified in their particular kind of work.

For the last two weeks, Chief Henry has been holding mental examinations in various parts of the state, and those candidates who have passed these examinations are being sent to competent physicians near their homes for eyesight examination. To those who satisfactorily pass this additional test, certificates will be given. The results of the eyesight examinations are being forwarded to the mining department, and Chief Henry declares that there are only a few cases where the eyesight of the men has been found so defective as to warrant certificates being withheld.

It is explained, that in many cases the presence of gas in working places would be detected by its effect upon

the flame of the safety lamp were it not that the mine foremen and firebosses are unable to see as well as they should.

### Ellsworth Community Meet

*SYNOPSIS—This meet was remarkable for the large percentage of men in training, about one person in nine of the men in the mines and at the ovens showing an expert knowledge of first aid. The demonstration was held on home grounds so that all might attend. The children and the adolescent population took a part as important as that allotted to the adults.*

■

The meeting at Ellsworth, about to be described, was known as the Third Annual Mine-Safety demonstration of the Ellsworth Collieries Co., but that corporation does not confine its interest to the men in its mines and at its ovens, but has an equal concern for them in their homes and a no less marked desire to make Ellsworth a desirable place for their families.

The visitor to our first-aid meets sees a mere sprinkling of women, no children and only the very best of the company's men. A visit to an Ellsworth meet is different. The whole community is in evidence. As can be seen in the first two sections of the panorama, the children and their teachers occupy the first seats and a careful review of the long lines of people will show a number of "citizens in the making."

#### HELD AT HOME WHERE ALL CAN ATTEND

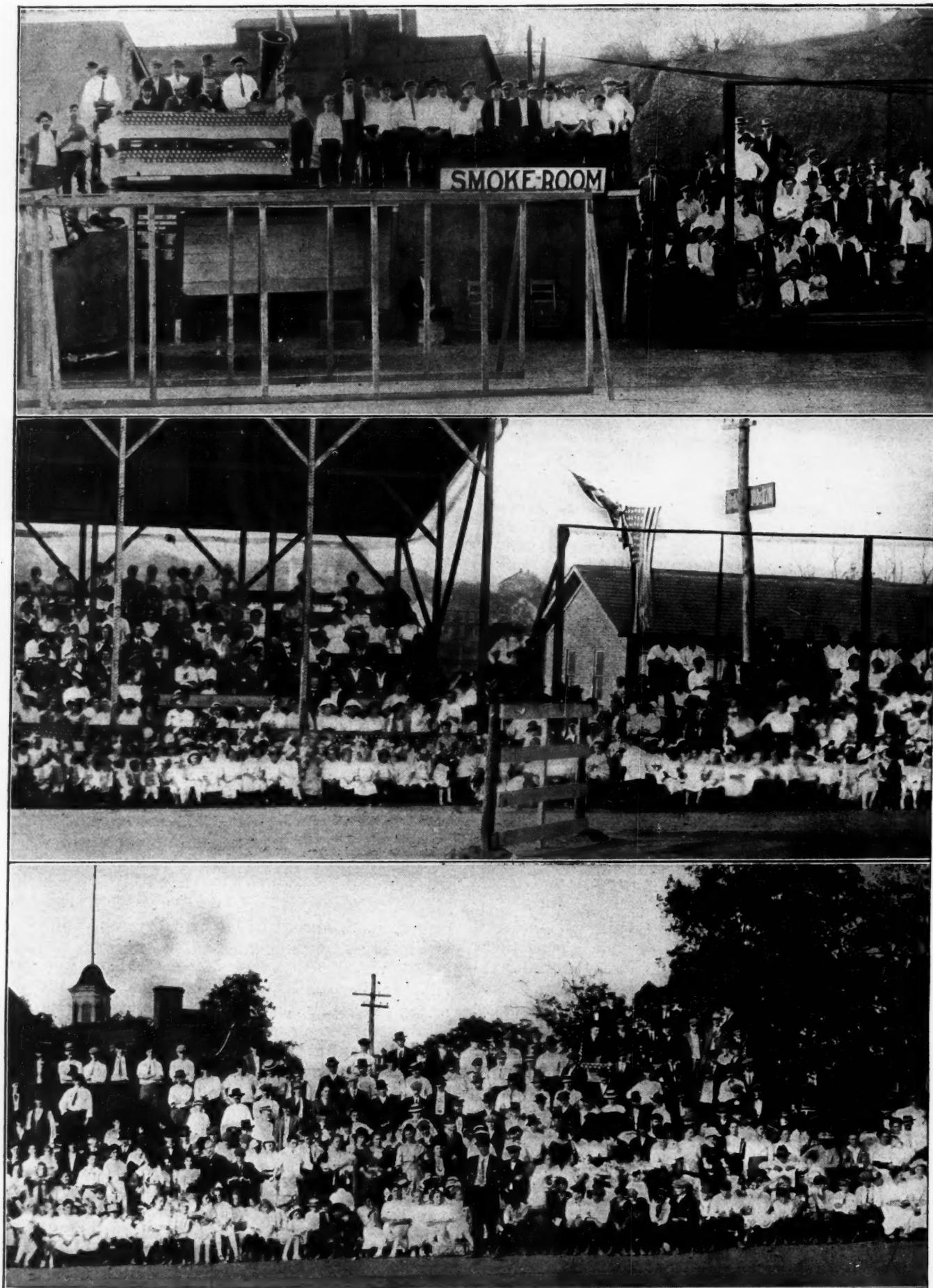
Of course, this characteristic of the meet arises largely from the fact that it is held in the town of Ellsworth, where many of the miners and their families live, and not, as is usual, at a park several miles away. But a more important reason, and those who know Ellsworth and Cokeburg will be the first to declare it, is that the Ellsworth Collieries Co. has employed a sociological superintendent, E. E. Bach, who has kept the idea of the community needs clearly in mind.

The unfortunate part of the social work around mines has been that it has not included a sufficiently wide scope; the schools, the entertainments of the adults, the pleasures of the young boys and girls have been entirely overlooked, and at best safety, sanitation and village comeliness have covered the whole ground.

The reader will be interested to note in the panorama the commissary girls, the camp-fire girls, the boy scouts and the special stands for the children. Yet the long line of helmetmen back of the last mentioned squads shows that mine-rescue work has not been forgotten, even though the Ellsworth and Cokeburg mines have so far, we believe, never called on the services of their trained men.

#### THE EMPHASIS IS LAID ON THE SCHOOLS

The meet was held on Tuesday, Sept. 22. A special car with several officials and guests arrived at 10:30 a.m. and immediately made an inspection of the schools, where the children sang their songs and performed their fire drill.

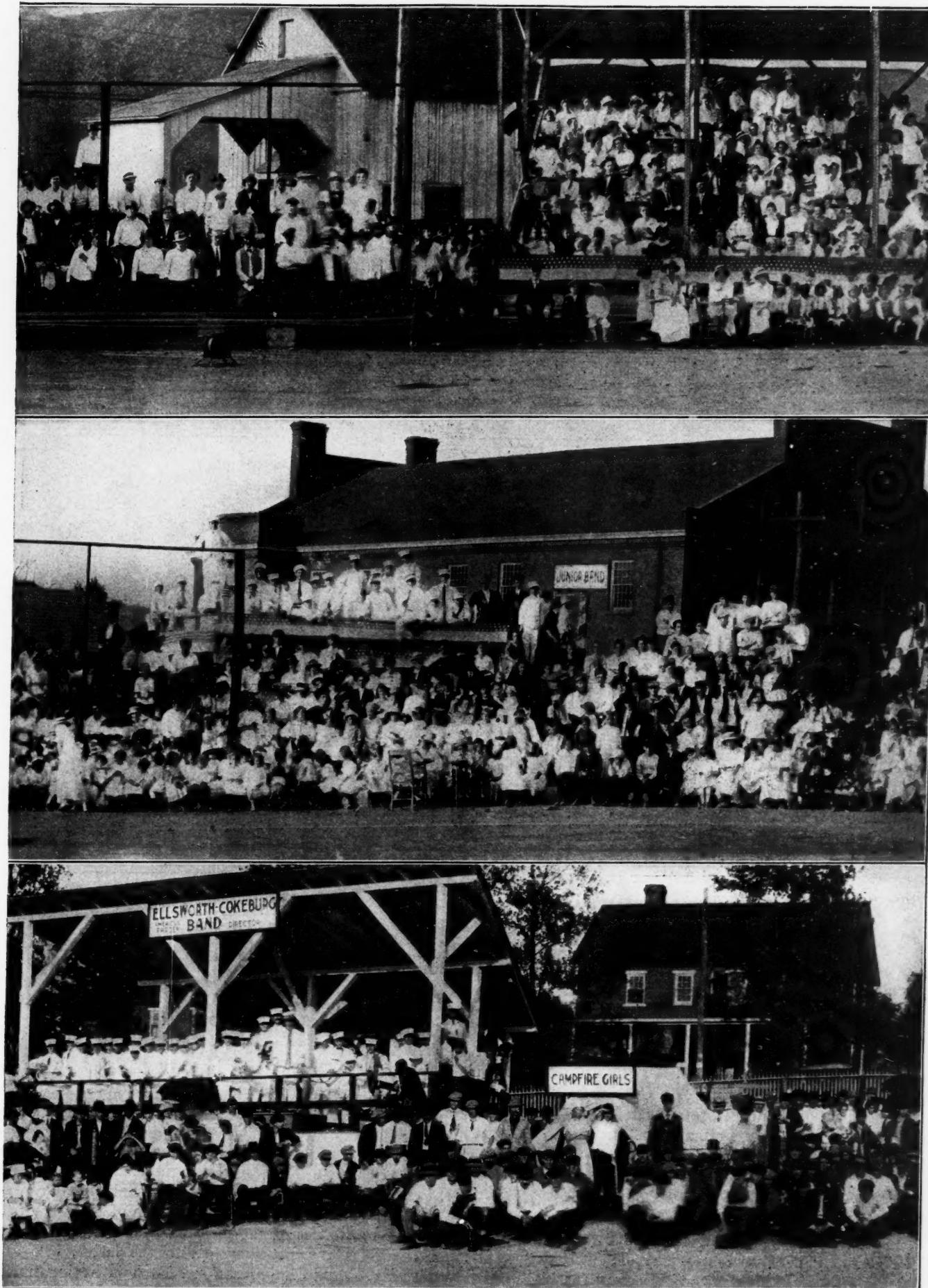


AT THE ELLSWORTH MEET THE CHILDREN TAKE A LEADING PART WITH THEIR PARENTS. THE

October 31, 1914

COAL AGE

719



CAMP-FIRE GIRLS AND LOCAL BANDS ARE STRIKING COMMUNITY FEATURES OF THE CELEBRATION



THE CHILDREN AT THE FIRST-AID MEET AT ELLSWORTH, PENN., FORMED A LIVING FLAG AND A RED CROSS AND  
SARY ARE WORTH NOTING AS WELL AS THE

The building, containing 500 children, was emptied in  $1\frac{1}{4}$  min. Luncheon was served in the clubroom for guests at 12 o'clock and at 1 p.m., with the arrival of the Cokeburg train, the celebration commenced.

The Ellsworth-Cokeburg band, with Americus Pardini as director, gave a concert, and then children lined up in procession behind the Ellsworth-Cokeburg boys' band. The members of this organization can be seen in the second section of the panorama, standing on a platform erected specially for them.

#### BOY SCOUTS AND CAMP-FIRE GIRLS

As will be seen, some of the children were grouped so as to form an American flag and others to represent the Red Cross. There were also maypole drill girls, tambourine girls and kindergarten athletes. The boy scouts, under Scout-master M. H. Moran, acted as messengers, and the camp-fire girls served lunch to the 900 school

children and 200 first-aid men and other participants at the close of the exercises.

#### ELEVEN PER CENT. OF THE MEN ENROLLED

The Ellsworth Collieries Co., at Ellsworth and Cokeburg, mined 1,729,000 tons in 1912. It had 30 teams entered in the demonstration or one team for 57,000 tons annual capacity. To put the matter another way; there are about 1700 men in the mines of the company. Thus, there is one team to 57 men or one enrolled first-aid man to every 9.4 men. This is also a remarkable record and shows that first-aid has become popular among the miners, a large proportion of whom are men of foreign birth. These, too, are not of the most assimilable types, being largely Slavs and Russians. With the latter, who are unusually hard to approach, Mr. Bach is having much success.

Owing to lack of space, it has been necessary in the



PERFORMED MAYPOLE EXERCISES. THE SUBSTANTIAL BUILDINGS AND HOMES, THE BOY SCOUTS, THE COMMIS-  
LONG LINE OF HELMETMEN AND THE AMBULANCE

panorama to omit one of the largest groups of participants, the aim being to make the presentation representative rather than complete.

The three teams scoring 100 per cent. were as follows:

American team: Alex McBurnie, captain; Alex Lilly; John Williams; Walter Arnhold; John Rogers and Charles Welling. Italian team: Dominick Duluce, captain; Joe Rucello; Mike Curello; Joe Rosetta; Nick Ceci and Dan Lowby. Slovak team: Steve Petura, captain; Joe Litichy; Joe Sokol; Tom Kotula; Joe Peshik and Adam Ohutskay.

The judges of the work were Dr. W. T. Davis, of the American Red Cross, Washington, D. C., Doctors L. W. Hoon, R. Stewart and G. K. Hays, of Monongahela, and Dr. T. W. Hunter, of Charleroi. Owing to the length of the program only one mine-rescue event was demonstrated by the teams from Ellsworth Mines 1 and 2 and Cokeburg, respectively. The work was done in the imaginary mine shown to the left of the first part of the panorama. The judges in this exhibition were C. G. Brehm, of the Oliver & Snyder Steel Co. Coal Department, and

W. W. Fleming, of the Republic Iron & Steel Co.

Six boys, between 10 and 11 years, gave a remarkably proficient exhibition of first-aid, after the adult teams completed their first-aid work.

The guests from out of town included E. A. S. Clarke, president of the Lackawanna Steel Co. and Ellsworth Collieries Co., New York City; C. H. McCullough, Jr., vice-president of the steel company and general manager of the coal company, Buffalo, N. Y.; G. W. Burleigh, a director in both corporations, New York City; W. A. James, chief engineer of both companies, and W. A. Luce, assistant general manager and director of the Ellsworth Collieries Co., Pittsburgh, Penn. W. R. Crane, dean of the mining department of Pennsylvania State College, was also present.

38

During the last 20 years, 177 persons have lost their lives through accidents caused by spontaneous combustion in coal mines in the United Kingdom.

## Discussion By Readers

### Mining Laws, Legislation and Mine Regulations

*Letter No. 2*—I have always considered that it was an unjust act on the part of the framers of the Pennsylvania bituminous mining laws, to legalize the nonreturn of their examination papers to candidates trying for certificates of qualification as inspectors, foremen and firebosses. I have never been able to discover any good or even plausible reason why these papers should be retained and filed in the Department of Mines, at Harrisburg, as "state documents." If my idea of such documents is correct they are intended either for public investigation under the supervision of the department or to be used as references by the department.

In the first event, no one other than the applicants themselves would have sufficient interest in such papers to take the trouble and go to the expense of an examination; and, in respect to the latter, I cannot conceive in what way the papers would be of any material value to the department, for the purpose of reference. That there must be a reason it is fair to assume, but what that reason is must be purely a matter of conjecture. The most natural supposition for a candidate to make is that he is refused the return of his papers in order to hide any evidence of possible fraud or to avoid exposing any ignorance or error, on the part of the board in the correction of the papers.

While such a reason is, of course, within the range of possibility and may or may not be true, it is clear to any unprejudiced mind that the refusal to return the examination papers of a candidate, after the examination is completed and the marks determined, cannot but have a psychological effect on the candidate that is detrimental to either his mental or moral stamina. Such a refusal proclaims the superiority of the examining board in a manner that is neither pleasing nor helpful to the candidate and far from satisfactory in the event of his failure to pass the examination. In a word, this requirement of the law practically makes the examining board supreme, without affording the unfortunate candidate his unquestioned right of satisfaction.

It has often been remarked that "an examination is not a means of finding out what a man *does* know, so much as ascertaining some of the essential things he *does not* know." Now, it is the important things that we *do not* know that are of the greatest interest to us. Indeed, acquainting ourselves with the essential things of which we are ignorant is one of the chief elements of success.

No argument is required to prove the fact that every man is entitled to the benefit that may accrue from a knowledge of his mistakes. For this reason, to deprive a candidate of the opportunity of knowing and studying the exact points wherein he has failed in examination is undeniably an act of injustice to the candidate. On the ground of "equal rights to all men," guaranteed by our

constitution, a law requiring such action on the part of any examining board should rightly be declared unconstitutional.

While referring to the examination of candidates for certificates of qualification to act as mine foremen, firebosses, etc., there is another question of equal importance to that I have just discussed; namely, the personnel of the examining board and the ability of its members to pass on the technical qualifications of candidates. Examining boards are quite generally composed of representatives of the state, the coal companies and the miners, respectively. Unfortunately, the manner in which the representatives of the last two classes named are appointed is no guarantee of their individual qualifications or ability to pass on the technical questions that must be asked in these examinations.

It is true that the representative of the coal companies is generally a superintendent who is, or should be, by virtue of his position, well versed in both the technical and practical principles of mining. However, I do not think that it is too broad an assertion to make to say that two-thirds of our mine superintendents are incapable of passing on technical questions relating to mining. This assertion by no means reflects on the practical capability of these men to act as mine superintendents. Neither do I mean to say that any man who accepts a position on an examining board, to act as representative for his company, necessarily belongs to this class. It may be stated with all fairness, however, that the capabilities of any member of an examining board should not be less than those required by law of the candidates whom they examine, in order that they may be able to pass with exactitude on the questions asked the candidates and the answers given in reply.

The same is true of the miners' representative on the examining board, who the law requires shall be "a man in actual practice," or actually engaged in the mining of coal. It is to this member of the board that many candidates in examination look for justice and, in order that he may faithfully acquit himself of the duties of his office and meet the expectations of candidates, he should be able to pass a similar examination himself. In other words, *he should himself hold a certificate of competency obtained by having successfully passed a previous examination.* Without such qualifications on the part of the representative of the miners, their interests, in this regard, are but indifferently safeguarded.

This aspect of the law I believe could be materially improved by permitting the miners to choose, as their representative, a man who is duly qualified to sit upon the board, without regard to the position he occupies in the industry. If they were granted this franchise, I am assured that they are so fully awake to the requirements that their choice would be a good one.

I regard this question of sufficient importance that it should demand the consideration of every man engaged in the mining industry, in whatever capacity he may serve.

Mining men should ask for the repeal of the statute to which I have referred and the substitution therefor of a mandatory law compelling the return of candidates' papers, with all errors properly marked and the correct answers given as determined by the official board.

I. C. PARFITT.

Jerome, Penn.

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### Fuel Economy in Coal Mining

Noting the numerous references, in COAL AGE, relating to the need of greater care in the purchase of coal for fuel purposes and the need of economizing on the use of fuel in other industries, it seems to me of growing importance to apply the same principle of economy in the use of fuel for the production of power, in coal mining.

A few years back, the fuel question, at coal mines, was not considered worthy of any consideration. The ease with which coal could be hoisted from the mine and dumped into the boiler-house chute made this item appear an inconsiderable expense from the coal operator's standpoint. It might be that from 15 to 20 boxes of coal would be dumped into the boiler chutes in a day, of which no account would be taken. In fact, frequently, the operator did not care what amount of coal was used for this purpose.

That condition has greatly changed, and today all up-to-date operators and superintendents are making every effort to economize in the use of fuel at the mines, for power purposes. In this respect, I may be regarded as a crank; but coal has a value to me, without reference to the abundance of its supply at the mine. I consider coal is always worth its market value to the coal operator, as well as to the manager of other industries where coal must be purchased.

When inspecting a mine, I investigate the fuel question as carefully as any other matter. I want no leaky joints in steam lines or leaky valves, either in the boiler house or anywhere else about the plant. It is extremely important that blowoff valves should be tight or fuel will be wasted. Scaly boilers, dirty flues, as well as leaky joints and valves are robbers of fuel. A careless fireman can waste many times more fuel than could be paid for by his wages.

Once every year the engines and other machinery should be indicated by a competent engineer, who is capable to check up the system and ascertain the efficiency of the boiler plant, in respect to the consumption of fuel. By this means, he will be able to make many valuable suggestions, both in respect to the heating arrangements around the plant and the appliances for heating the feed water of the boilers. I consider the heating system should be in circuit and traps arranged to carry off the water of condensation, while the waste steam is conducted back to the heater.

Feed-water heaters should be kept clean and in good working order. Much economy is effected by heating the feed water to a constant temperature of 200 deg. F. or above.

In respect to the consumption of fuel, it is important to give close attention to the drainage system, both on the surface and in the mine. All surface waters should be prevented, as far as possible, from finding their way into the workings of the mine, which will greatly reduce the duty of the pumps. The drainage system underground

should be as concentrated as possible, all the water, as far as practicable, being drained by ditches into the main sump. By thus reducing the amount of water to be pumped and concentrating the work, much economy can be effected in fuel consumption in mine drainage.

At all plants where coke is manufactured, the breeze or fine refuse of the coke should be carefully collected and burnt in the boilers, instead of being thrown on the waste dump. A car and a half of breeze is about equal to one car of good coal for fuel purposes. As the boiler plant is commonly located close to the ovens, the cost of collecting and transporting the breeze to the boilers should be practically *nil*.

In order to keep everyone alive to the importance of economizing fuel, at a coal mine, an exact record of every car of coal dumped should be kept on the weigh sheet, whether such car goes to the boilers or to the loading chutes. Every competent foreman should make it his business to know how much coal is consumed by the plant in his charge. Every tipple should have a separate chute for the coal for boilers.

A good plan is to have the boiler track of the same gage and connected with the mine track, so that mine cars can be run into the boiler house every night, for the purpose of loading the ashes, which in many cases can be used advantageously to ballast the tracks in the mine. An important point in the firing of boilers is to keep the ashpit clear, which saves the grate-bars. The ashes make a good track ballast, and the mules can do better work when the roadbed is thus kept in good condition.

PENNSYLVANIA ENGINEER.

Olyphant Furnace, Penn.

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### Proposed Method of Working to Reduce Expense of Upkeep

In connection with the discussion of various methods of working, the following proposed plan will be of interest in relation to reducing the expense of upkeep of the roads and air courses in a mine.

Since taking charge of the mine where I am at present employed, I find that, at the present rate of progress, it will take from six to seven years to drive and finish a single pair of butt-entries from the main entries to the next pair of face entries, a distance of 1200 ft. The reason for this great length of time is that too many butt-entries are being kept open and the work is scattered over too large an area. The maintenance of these entries requires a large amount of timber, besides entailing a considerable extra expense for retimbering roads and air courses and keeping up the tracks.

In addition to the extra cost of maintaining long roadways and air courses, there is a considerable increase in the expense of haulage. Because of the work being so scattered, drivers are compelled to haul long distances and much time is lost of necessity, which would not occur if the work were more concentrated. Another large loss results from the fact that when the mine closes down for the summer, as it frequently does, much of the pillar coal is crushed and cannot be recovered when work is again resumed in the fall.

To overcome these difficulties and losses, I propose to concentrate the work by driving two pairs of butt-entries, the entire distance of 1200 ft. between the main and face entries. When this has been done and the work

opens up in the fall rooms will be turned, starting from the inby end or close to the face entries. A sufficient number of rooms will be turned off both entries to give the daily output desired. At the present time, we are driving rooms a distance of 140 ft. with a width of 18 ft. Since the coal is 3 ft. 6 in. thick, I estimate that each room will yield about 300 tons of coal in the first working.

By driving two pairs of butt-entries and opening 24 rooms on each entry of each pair, making 96 rooms in all, I believe we can count on sufficient coal for an output of, say 1000 tons per day. By this arrangement, instead of the work being distributed through 13 pairs of entries, as formerly, it will be much more concentrated. Fewer drivers will be required to perform the same work, and it will be possible to maintain a much lesser length of roadways and air courses.

The coal, in this mine, is undermined by compressed-air punching machines, each machine-runner cutting the coal in six rooms. I estimate that the butt-entries can be driven the entire distance (1200 ft.) in six months or, say from July to February, inclusive. Then, if the rooms started from the inby end can be driven up in four months, this will leave two months for drawing back the pillars in these rooms before the close of the season.

My plan is to lay a 3-in. air line to the face of each pair of butt-entries, which will supply sufficient air to operate two machines on each entry, each of these machines cutting six rooms each shift, or 12 rooms per day. If this arrangement is successful, it will be possible to work out the 48 rooms on each pair of butt-entries, in 12 months.

I further plan to work out the remaining 16 rooms on each butt-entry and draw back the entry pillars and room-stumps the following winter. By this system, I expect to work out the entire area of coal in our tract in three years, with very little loss of coal and a greatly reduced expense for upkeep. The expense of maintaining the roadways, in the present system of working, is exceedingly heavy on the first 200 yd. of the butt-entries, owing to the fact that the rooms in this distance have been worked out and the pillars drawn, which throws a heavy weight on the entry pillars.

In the proposed new system, the first 450 ft. of the butt-entries will remain in solid coal until the 24 rooms inby from this point are worked out and finished. Besides the reduced cost of upkeep, the new system will afford better coal in pillarwork and secure greater safety to the miners.

MOSES JOHNSON.

Taber, Alta, Canada.

## Study Course in Coal Mining

BY J. T. BEARD

### The Coal Age Pocket Book

**Diameter of Water-End**—The diameter of the piston or plunger of a direct, double-acting pump is calculated from the required actual capacity or discharge and an assumed efficiency of the water-end, for a given piston speed.

The water-end efficiency of a direct-acting piston or plunger pump will, of course, vary with the age, condition and workmanship of the pump and packings. The average efficiency in mine work is generally considered as not much exceeding 65 per cent. at the water-end; while that of a new pump or one in good condition and well packed, may be 85 per cent.

The diameter ( $d_w$ ), in inches, of the piston or plunger required to discharge a number of gallons ( $G$ ) per minute, at a piston speed ( $S$ ), in feet per minute, assuming a water-end efficiency ( $E_w$ ), is calculated by the following:

**Rule**—Divide the required discharge of the pump expressed in gallons per minute, by the assumed water-end efficiency, and that quotient by the piston or plunger speed in feet per minute and multiply the square root of the last quotient by 4.95; the product obtained will be the required diameter of the piston or plunger, in inches.

Expressed as a formula, this rule is

$$d_w = 4.95 \sqrt{\frac{G}{E_w S}}$$

Or, assuming, as is common, a water-end efficiency of 85 per cent.,  $E_w = 0.85$  and the formula becomes

$$d_w = 5.37 \sqrt{\frac{G}{S}}$$

**Example**—Assuming an average water-end efficiency of, say 65 per cent., calculate the required diameter of the plunger of a pump capable of delivering 300 gal. per min., at a piston speed of 60 ft. per min.

**Solution**—The required diameter of the plunger, under the assumed conditions, would be

$$d_w = 4.95 \sqrt{\frac{G}{E_w S}} = 4.95 \sqrt{\frac{300}{0.65 \times 60}} = 13.7 \text{ in.}$$

**Diameter of Steam-End**—The diameter of the steam cylinder of a direct-acting pump is calculated from the total pressure on the water-end when the pump is in operation and the available steam-cylinder pressure. As previously shown (see Pressure Required in Pumping), the diameter ratio between the steam and water ends of a direct-acting pump is equal to the inverse ratio of the unit or gage pressures on these two ends, which, by transposition, gives the following formula:

$$d_s = d_w \sqrt{\frac{p_w}{p_s}}$$

In most cases, especially in the operation of large pumps, it is safer to make a suitable allowance for the loss due to friction in the pump, which may reduce the effective steam-cylinder pressure from 5 to 10 per cent.

### The Coal Age Pocket Book

**Length of Stroke**—The size and capacity of pumps are commonly estimated for a given speed of the piston or plunger, expressed in feet per minute. The length of stroke is determined with respect to the diameter of the steam cylinder, and may vary from the length of such diameter to  $1\frac{1}{2}$  or 2 times that length. There results a loss of efficiency in the steam-end when the stroke of the pump exceeds twice the diameter of the steam cylinder.

**Number of Strokes per Minute**—The piston or plunger speed of a pump, expressed in feet per minute, divided by the length of stroke in feet, gives the number of strokes the pump makes each minute; according to the formula,

$$n = \frac{S}{l}$$

**Discharge of a Pump**—The discharge of a direct, double-acting pump is found by reversing the two formulas previously given for calculating the diameter; thus, for any efficiency  $E_w$ .

$$G = 0.0408 E_w S d^2$$

Or, for an assumed water-end efficiency of 85 per cent.,

$$G = 0.03468 S d^2$$

**Example**—Find the discharge of a 6-in. double-acting pump, running at a speed of 100 ft. per min., assuming an efficiency of 75 per cent. If the length of stroke is 10 in., find the number of strokes per minute.

#### Solution

Discharge,  $G = 0.0408 \times 0.75 \times 100 \times 6^2 = 110.16 \text{ gal. per min.}$

Number of strokes,  $n = 100 \times 12 \div 10 = 120 \text{ strokes per min.}$

**Example**—Calculate the required dimensions of a direct, double-acting pump capable of handling 9000 gal. of water per hour, under an effective head of 502 ft., when the available steam pressure at the pump is only 40 lb. gage, assuming a piston speed of 100 ft. per min.

**Solution**—The required capacity of this pump is  $9000 \div 60 = 150 \text{ gal. per min.}$ ; then assuming an efficiency of, say only 75 per cent. to make suitable allowance for wear and depreciation in use, the required diameter of the water-end (piston or plunger) is

$$d_w = 4.95 \sqrt{\frac{G}{E_w S}} = 4.95 \sqrt{\frac{150}{0.75 \times 100}} = 7.0 \text{ in.}$$

The water-end pressure is

$$p_w = 0.434 \times 502 = 217.8 \text{ lb. per sq.in.}$$

Since the available steam-cylinder pressure is 40 lb. per sq.in., the required diameter of the steam-end or the steam cylinder is

$$d_s = d_w \sqrt{\frac{p_w}{p_s}} = 7 \sqrt{\frac{217.8}{40}} = 16.33 \text{ in.}$$

In this case, it is proper to assume a stroke of, say 20 in., making the size of the steam cylinder  $16 \times 20$  in., by slightly increasing the steam pressure above the estimated 40 lb. gage. The size of the pump is, therefore,  $7 \times 16 \times 20$  in.

## Inquiries of General Interest

### To Prevent the Freezing of Mine Shafts

We have been considerably annoyed in previous winters and the work of hoisting coal has been much delayed by the accumulation of ice in the hoisting shaft. With a view of avoiding this trouble we have had under consideration, recently, two methods.

By one of these methods, it is proposed to heat the intake air to such a temperature that the water draining down the shaft will not freeze in cold weather. The other proposed plan is to line the shaft by the "gun-crete" method, so as to render it waterproof. By this plan, the entire shaft would be lined with an inch of reinforced concrete, applied by means of the cement gun that is now so extensively used in all cement work, in mining and other industries.

In choosing between these two methods and deciding which is the best means to employ for the purpose of avoiding the trouble to which we have referred, we desire to gain what information we can from the experience of others along this line. I might add that we are inclined to consider the first method mentioned more favorably than the second, for the reason that the steam used for the heating of the intake air would accomplish, at the same time, the humidification of the mine air, which is so much to be desired during the colder months of the year. We shall be glad to have your views in reference to the matter and to hear from other readers of COAL AGE who have had experience similar to our own.

A MINE SUPERINTENDENT.

—, Ohio.

We heartily commend the choice of correspondent for the purpose in view, although it must be admitted that there are certain disadvantages arising from the heating of the intake air passing down a hoisting shaft. These disadvantages, however, are slight in comparison with the advantages to be gained.

For the purpose of heating the intake air in the hoisting shaft of a large mine, we would suggest the installation of a system of steam pipes, say 1 to 1½ in. in diameter. The pipe line should be arranged to zigzag downward at the sides and on the faces of the shaft where the water is most troublesome. Each pipe line should connect with a pipe that will conduct the steam beyond the shaft bottom and permit it to discharge into the intake air current, at a point where the temperature of the air more nearly approaches that of the mine.

If the steam were allowed to discharge into the cold air at the shaft bottom, its condensation would cause a fog or mist that would impede the work of the cagers and trip-runners, but, discharging into the warmer air at a short distance in by from the bottom of the shaft, the moisture is quickly taken up by the warm dry air of the current and carried into the mine.

As is quite commonly recognized today, such a humidification of the air entering the mine prevents

the absorption of moisture from the mine workings and the consequent drying of the dust throughout the mine by the air current. The adoption of this method of heating the intake air, therefore, accomplishes two valuable purposes. It not only prevents the freezing of the shaft but affords the desired humidification of the air current and greatly reduces the danger of explosion due to the accumulation of dry dust in the workings.

The disadvantages of this method, to which we referred previously, are chiefly two: (1) The men working on the shaft bottom, the cagers, trip-runners and oilers, are compelled to work in a somewhat warmer atmosphere, which enervates or weakens some men more than others; (2) the heating of the downcast air produces a certain air column in the downcast hoisting shaft that is opposed to the general circulation and, to this extent, imposes an added duty on the fan.

The waterproofing of the shaft, on the other hand, by the so called "gun-crete" method, besides lessening the work of pumping, provides a clean, dry lining for the shaft and decreases the friction of the air current, which may become quite appreciable in deep shafts of contracted area, in the ventilation of a large mine requiring a considerable air volume.

*We shall be glad to have readers of COAL AGE who have had experience in similar situations discuss this question from a practical standpoint, giving their ideas and conclusions.*

### Equivalent-Orifice Formula

Kindly explain how the constant 0.0004 is derived in the formula for finding the equivalent orifice of an airway or mine. The formula to which I refer is

$$A = \frac{0.0004 q}{\sqrt{w.g.}}$$

in which  $A$  is the area of the orifice (sq.ft.);  $q$  the quantity of air passing (cu.ft. per min.); and  $w.g.$  the water-gage (in.).

A STUDENT.

Belleville, Ill.

The formula given by correspondent is derived from the well known formula for the theoretical velocity ( $v$ ) in feet per second, due to a given head ( $h$ ) in feet,  $v = \sqrt{2 gh}$ , combining this with the ventilating formula  $q = av$  and allowing for *vena contracta*, the coefficient being 0.62, and multiplying by 60 to reduce to minutes.

$$q = 60 \times 0.62 A \sqrt{2 \times 32.16 h} = 298.3 A \sqrt{h}$$

But, taking the weight of 1 cu.ft. of air as 0.0766 lb., since the pressure per square foot is 5.2  $w.g.$ , the head is  $5.2 w.g. \div 0.0766 = 67.88 w.g.$ , which substituted for  $h$ , in the last equation, gives

$$q = 298.3 A \sqrt{67.88 w.g.} = 2457 A \sqrt{w.g.}$$

Hence,  $A = \frac{1}{2457} \frac{q}{\sqrt{w.g.}} = \frac{0.0004 q}{\sqrt{w.g.}}$

## Examination Questions

### Hoisting Engineers' Examination, Held at Springfield, Ill., Oct. 12, 1914

#### (Selected Questions)

**Ques.**—Find the approximate horsepower exerted by a pair of hoisting engines, cylinders 30 in. in diameter, steam pressure, 60 lb.

**Ans.**—Since the power exerted by an engine depends on its speed or the number of revolutions per minute and this is not stated, the question as it reads cannot be answered.

However, assuming that these engines have a piston speed of, say 600 ft. per min., and that the steam pressure given is the mean effective pressure in the cylinder, the horsepower developed is

$$H = \frac{2(0.7854 \times 30^2) \times 60 \times 600}{33,000} = 1542 + \text{hp.}$$

**Ques.**—Find the useful horsepower during a hoist of two tons of coal up a shaft 1500 ft. deep, in 50 seconds.

**Ans.**—Assuming that the term "useful horsepower" refers to the power consumed in the hoisting of the coal only, disregarding the dead load of the rope and friction and supposing the car and cages to balance each other as they do in a double-compartment hoist, the horsepower in that case is

$$H = \frac{2 \times 2000 \times 1500}{\frac{5}{6} \times 33,000} = 218 + \text{hp.}$$

**Ques.**—If the safety valve on a boiler is  $4\frac{3}{4}$  in. in diameter and the lever is 38 in. long from the fulcrum to the center of the weight and  $4\frac{1}{2}$  in. to the center of the valve, the weight being 85 lb., what is the pressure of the steam exerted on the valve, in pounds per square inch?

**Ans.**—In answering this question, the weight of the lever, valve and valve-stem acting through their center of gravity must be ignored, since these are not given in the question.

The area of the valve is  $0.7854 \times 4.75^2 = 17.72$  sq.in. Then, calling the required steam pressure, in pounds per square inch  $p$ , and equating the moment of the total pressure on the valve with the moment of the weight, we have

$$17.72 p \times 4.5 = 85 \times 38$$

$$p = \frac{85 \times 38}{17.72 \times 4.5} = 40.5 \text{ lb. per sq.in.}$$

**Ques.**—The total pressure on the steam piston is 100 tons; if the diameter of this piston is 24 in., what is the pressure of steam per square inch?

**Ans.**—The area of the piston is  $0.7854 \times 24^2 = 452.39$  sq.in. The pressure per square inch on the piston is, therefore,  $100 \times 2000 \div 452.39 = 442 + \text{lb. per sq.in.}$

**Ques.**—What will be a safe working load for a steel hoisting rope  $\frac{7}{8}$  in. in diameter?

**Ans.**—The question should state whether an ordinary steel rope or an extra-strong steel rope is intended, as

a 6-strand, 19-wire ordinary steel rope 1 in. in diameter has a breaking strain of 34 tons, while that of a similar extra-strong steel rope of the same diameter is 39 tons.

The formula for determining the strength of 6-strand 19-wire hoisting ropes is based on the breaking strains of the same class of rope 1 in. in diameter. Thus, using a factor of safety of 5, the safe working load for a 6-strand, 19-wire hoisting rope, of each class, is

Ordinary steel,

$$L = \frac{1}{5} (34 d^2) = \frac{1}{5} \times 34 (\frac{7}{8})^2 = 5.2 \text{ tons.}$$

Extra-strong steel,

$$L = \frac{1}{5} (39 d^2) = \frac{1}{5} \times 39 (\frac{7}{8})^2 = 6.0 \text{ tons, nearly.}$$

**Ques.**—What weight will a single engine of the following dimensions lift: Diameter of cylinder, 2 in.; length of stroke, 18 in.; geared at 4 to 1; diameter of drum, 6 ft.?

**Ans.**—The question omits to state the available steam pressure in the cylinder and, therefore, as the question reads, it cannot be answered.

However, assuming that the available steam pressure is, say 50 lb. per sq.in., the total cylinder pressure will be

$$P = 50 (0.7854 \times 12^2) = 5655 \text{ lb., nearly.}$$

Now, assuming that this total pressure is applied horizontally to the crankpin, which is one-half the length of stroke or 9 in., and calling the required weight to be lifted,  $W$ , the radius of the drum being  $(6 \times 12) \div 2 = 36$  in., and equating the moment of the steam pressure multiplied by the ratio of gearing with the moment of the load, we have

$$5655 \times 9 \times 4 = 36 L$$

$$L = \frac{5655 \times 9 \times 4}{36} = 5655 \text{ lb.}$$

**Ques.**—What are the four electrical units?

**Ans.**—The four common electrical units are the volt, ampere, ohm and watt.

**Ques.**—Define the four electrical units.

**Ans.**—The volt is the unit of electromotive force or the so called "pressure" of an electric current. It corresponds to the pressure producing the circulation of air in an airway or of water in a pipe.

The ampere is the unit that measures the "strength of the current" or the quantity of current flowing. This unit corresponds to the volume of air passing in an airway or the quantity of water flowing through a pipe.

The ohm is the unit of resistance. It is the resistance of a current of one ampere, flowing under a pressure of one volt.

The watt is the unit of electrical power. It is the power required to pass a current of one ampere, under a pressure of one volt. It corresponds to the work in foot-pounds per minute, in ventilation.

**Ques.**—How many gallons of water will a tank hold that is 9 ft. 11 in. high and 53 in. in diameter?

**Ans.**—The capacity of the tank is

$$\frac{119 (0.7854 \times 53^2)}{231} = 1136 + \text{gal.}$$

## Coal and Coke News

### Harrisburg, Penn.

An order was issued by the Inter-State Commerce Commission on Oct. 20, requiring several railroads in the bituminous region, namely the Pittsburgh & Lake Erie and the Baltimore & Ohio, to make through rates on coal from the Avella group of mines in Washington County, to points outside of Pennsylvania and these rates should not be more than 10c. per ton higher than the through rates from mines on the West Side Belt R.R. The new rates must go into effect on the first of next year and be in force for two years.

The decision is the outcome of a complaint filed by the Pittsburgh & Southwestern Coal Co., the Pryor Coal Co., the Waverly Coal Co., and the Avella Coal Co. against the Wabash-Pittsburgh Terminal, the West Side Belt Line, the Pittsburgh & Lake Erie, the Baltimore & Ohio and other roads, declaring that the rates on coal from their mines are unreasonable and unlawfully discriminatory.

No joint rates are maintained from the Avella group of mines, and the local rate of 30c. per ton is charged by the Wabash-Pittsburgh Terminal for hauling coal to Pittsburgh Junction, while joint rates are in effect from mines on the West Side Belt Line. The complainants say they are entitled to the same consideration.

The commission on the above date heard argument and reserved its decision at a meeting in the Federal Building, Philadelphia, on the complaint of the Mitchell Coal & Coke Co. against the Pennsylvania R.R. to recover damages for alleged illegal rebating.

The case was originally filed in the District Court and resulted in a verdict of \$40,000 for the coal and coke company. Upon appeal to the Supreme Court the latter tribunal reversed this finding on the ground that the complaint should have been made to the commission, and, in the event of a favorable finding, suit should have been brought in court.

The industrial railroad cases involving the claims for restoration of allowances to the "Short Lines" by trunk lines will be argued on Nov. 19. The final testimony will be taken Nov. 9 in two cases postponed from this week. Fifteen railroads are involved.

#### PENNSYLVANIA

##### Anthracite

**Jeddo**—The G. B. Markle Coal Co., in whose mines the man was hurt, is financing the return to his parents in Italy, of 24-year-old Cosemo Scalpi, whose back was broken last March and who can never walk again. The company will send along a man to nurse the patient on his 4500 mile journey.

**Parsons**—Fire of unknown origin, on Oct. 22, broke out in the washery operated by Samuel Chase, of Wilkes-Barre. The frame structure was outside of the city limits, but to protect property on the lower side of the creek and in the city, several streams were turned on the blaze by the city firemen. The headway gained by the flames before an alarm was sent in made it impossible to save the washery, however, and it was destroyed.

**Harrisburg**—An informal report recently issued by the Department of Mines says that the state inspectors, operators, and miners are all working toward the end of safety, there having been a decided decrease in the number of fatalities during the three months ending Sept. 30, 1914, compared with the corresponding quarter of 1913. The comparisons of these fatalities are as follows:

Anthracite, 1914—killed, 137. Bituminous, 1914—killed, 102. Anthracite, 1913—killed, 156. Bituminous, 1913—killed, 154. Decrease, 19, or 12 per cent. Decrease, 52, or 34 per cent.

Statistics of non-fatal accidents have not been completed, but it is believed they will make as favorable a showing as the fatal accidents.

**Wilkes-Barre**—The threatened strike at the Stanton Colliery at Wilkes-Barre was averted recently by the patchers returning to work pending an investigation of their grievance that too much work is being placed upon them.

It is estimated that there are about 300 breakers in the

anthracite coal region, costing on an average \$200,000 each, some of the larger and more elaborate buildings running as high as \$300,000 to \$500,000. It is alleged that if the preparation of anthracite for market after it is mined were conducted as a separate industry, it would require a capitalization of at least \$100,000,000.

#### Bituminous

**Connellsville**—The Connellsville coke production and output recently established a new low record, and is still going down. This record was 237,000 tons, or a drop of 8000 tons from the previous week. With the blowing out of 1200 ovens by the H. C. Frick Coke Co., a still further decrease in production was effected. It is believed by some that the output will run as low as 225,000 tons by the close of October.

**Johnstown**—Alleging that he received in the mines of the Citizens Coal Co., on Oct. 8, 1914, permanently disabled him and prevented him both from playing baseball and earning a living at his occupation of coal mining, John Russel has filed a suit, asking \$10,000 damages.

**Brownsville**—The Lilley Coal Co., with one of the largest and best equipped plants in Fayette County, has shut down its operation indefinitely. The company owns about 700 acres of coal land. It has a new plant, and if running at full capacity would employ 400 men. The plant has only been operating two days a week for the past two months. On Oct. 15, it is stated, 85 men were laid off and notice was given later that the plant would shut down indefinitely on account of lack of orders.

**Big Bend**—Coal operators in this vicinity report that many new orders have been received lately from Eastern coal dealers, who say they are storing immense quantities of fuel on the Atlantic seaboard. It is said the orders are in sufficient volume to keep the mines in operation until well into the summer.

**Greensburg**—The appraisement filed in the United States district court of the assets and properties of the Pittsburgh-Westmoreland Coal Co., by Julian Kennedy and R. C. Crawford, the appraisers appointed by the court, is \$13,676,115. The total net obligations of the company are about \$6,800,000. The company went into the hands of receivers July 29 last on account of the maturity of a \$900,000 two-year note issue which matured Aug. 1 and which it was unable to take care of on account of the sudden breaking out of the European war. The net operating earnings of the company for the last fiscal year prior to the receivership was \$899,465. It is understood that the interest coupons will be paid when due.

#### WEST VIRGINIA

**Vivian**—The tipple of the King Coal & Coke Co., located on Laurel Creek, was recently damaged considerably by fire. The origin of the fire is not known. The flames were discovered about 9:30 o'clock in the evening, and were not under control until about 4:30 a.m. The damage is estimated at approximately \$20,000, which is said to be covered by insurance.

**Moundsville**—The Ben Franklin Coal Co. of West Virginia has discontinued the use of open lights at its Panama mine in the southern part of Moundsville, and has installed electric safety lamps, the latter being now in use. The Hirsch electric safety lamp, which has been approved by the U. S. Bureau of Mines, is employed. It is believed that this is one of the biggest steps for the safety of employees and property which has been taken by any West Virginia coal company.

#### TENNESSEE

**Jellico**—Demonstration teams representing 18 mining companies of Kentucky and Tennessee have signified their intention of competing for the Mine Foremen's Association's prizes to be offered at the field day to be held here shortly.

#### KENTUCKY

**Barboursville**—Miners have returned to work in the Tye Fork district on a compromise basis after a strike which had tied up operations for some time. It is stated that changes in the wage scale after the companies had installed electrical apparatus were not satisfactory to the miners. Both sides made concessions, it is understood, but details are lacking.

**Louisville**—The second operation of the Harlan Coal Mining Co., the Snead & Meguire enterprise, was opened at Kayu in Harlan County on Oct. 24. This is on the opposite side of the valley from the Coxton operation of the company and though a separate tipple, screening plant, etc., are required, the same loading facilities will be employed. The Harlan company is operating regularly in spite of the condition of the market.

**Central City**—The agreement under which the local mine of the Central Coal & Iron Co. has resumed operations provides that arbitration of differences between the company and the miners shall be disposed of by the National Executive Board of the United Mine Workers. The difference between the miners and the company was on the appointment of D. Stewart Miller, commissioner of the Operators' Association, as arbitrator for the company. Many improvements, including a new tipple and engine chutes and betterments inside the mine have been completed at a cost of \$50,000.

**Jenkins**—Six out of twelve of the mines of the Consolidation Coal Co. and the Elk Horn Mining Corp. in the Jenkins-McRoberts-Fleming-Haymond-Hemphill field have closed down owing, it is said, to conditions brought about by the European war and the stagnation of markets throughout the country. Several hundred men are out of employment as a result of the closing of the mines.

#### OHIO

**Pomeroy**—In an effort to arrive at a correct interpretation of certain clauses of the agreement entered into last May, a series of conferences will be held at Pomeroy between the United Mine Workers and representatives of the Jackson Coal & Mining Co., the Newton Coal Co., and the Hutchinson Coal Co., operating in what is known as the Pomeroy Bend. There has been a misunderstanding between the coal company and its employees as to the meaning of Sections 1 and 19 of the agreement, which pertain to the suspension of work.

**Cleveland**—The No. 8 operators learned on Oct. 26 that the United States supreme court has refused them an injunction against the Ohio Industrial Commission to prevent the commission from enforcing the Ohio screened coal law. It also has denied the plea of the commission, which was to throw the case out of court as frivolous. The court held the screened coal law to be of such vital importance that the case should be heard immediately and set the full hearing for Nov. 30. This means that the highest court will probably render an opinion on this measure by Jan. 1, 1915. Sitting as a court, District Judges Fater and Killits and Circuit Judge Warrington held the screened coal law constitutional early in the summer.

**Glouster**—A meeting of the miners employed by the Sunday Creek Co., and the Pittsburgh Coal Co. will be held at Glouster at 1 p.m., Oct. 31, for the purpose of trying to get all of the operators to comply with the mine-run law. A different method is pursued at various mines which is said to be unsatisfactory to the miners.

**New Philadelphia**—Another effort is on foot for the organization of a miners union among employees of the small retail mines in the district surrounding New Philadelphia. A meeting was held recently, called by William F. Lincks, president of Sub-district No. 3. Several previous attempts to organize the retail mines have failed.

**Columbus**—There is considerable speculation in coal circles in Ohio over the coming changes in the organization of the Sunday Creek Co. According to the latest ruling of the courts, Nov. 4 is the time fixed for the separation of the ownership of the company from the Hocking Valley, the Lake Shore and the Chesapeake & Ohio railroads. So far no announcement has been made locally. It is pointed out that the reorganization of the company at this time is a most difficult problem and it is believed an extension of the time may be granted by the courts.

#### INDIANA

**Terre Haute**—The delegates from this city to the American Mining Congress at Phoenix, Ariz., Dec. 7, are J. C. Kolsen, W. E. Van Winkle and Frank Richards.

The Pittsburgh Mining Co. has brought suit against the Big Four Ry. Co. for \$3000 damages, alleging that a train wrecked a coal tipple at the mine near Sanford.

#### ILLINOIS

**Farmington**—The old Maplewood mine, or Black Hawk No. 1, will be again placed in operation in about six weeks, so it is alleged. This mine has been idle for the past five years, nothing being done in the way of upkeep or repairs during that time. It has taken the pumps almost a year of steady pumping to empty the pit so that men could move about therein.

**Princeton**—The property of the Marquette Third Vein Coal Mining Co. will be sold at sheriff's sale at Princeton on Monday, Nov. 2. This sale will be made to satisfy a judgment of Patrick Carney. Carney is now dead, but the money is due his estate. The mine is said to be worth approximately \$100,000.

#### NORTH DAKOTA

**Ryder**—It is said that the reservation coal lands are to be thrown open for entry in all probability by next fall, not sooner than September of 1915. They have yet to be appraised, and the appraisers have not been named. The regulations pertaining to the opening rest entirely with the Secretary of the Interior, so that no one can bespeak authoritatively how these lands are to be opened. It is thought, however, that because of the small number of these claims, less than a thousand, they will be thrown open to general settlement.

#### COLORADO

**Denver**—Contending that mine guards are being sworn into the Colorado militia during the reorganization, John R. Lawson, an officer of the Colorado district of the United Mine Workers, recently presented a protest to Chairman Foster of the House Mine Committee against the withdrawal of the Federal troops from the strike district.

#### WASHINGTON

**Seattle**—Speedy settlement of the strike that has been on in the Carbonado coal mines for nearly a month is promised as a result of a protracted peace conference that has just come to a close in this city. Officers and members of the Washington Coal Operators' Association representing the Carbon Hill Coal Co., owner of the mines, and officers of District No. 10, United Mine Workers of America representing the strikers, were the conferees. The grievances responsible for the strike were satisfactorily adjusted and an agreement under which the men will return to work unpenalized was reached.

### FOREIGN NEWS

**St. John, N. B.**—The coal output in the Minto coal region is not equal to the demand, and it will be necessary to greatly increase operations if the demand is to be met. At present, the daily output is about 300 tons. This will be brought up to 400 tons. It is said that Sir Thomas Tait, who is at the head of the Minto Coal Co., has been looking into the question of establishing a distillation or byproduct plant at the mines.

### RECENT COAL AND COKE PATENTS

**Smoke Jack.** W. Reenstrom, Chicago, Ill., 1,108,234, Aug. 25, 1914. Filed May 7, 1914. Serial No. 836,943.

**Grate Bar**—J. H. Dietz, Cleveland, Ohio, 1,111,059. Sept. 22, 1914. Filed Apr. 18, 1914. Serial No. 832,771.

**Mine Car Wheel**—A. B. Day, Knoxville, Tenn., 1,109,906, Sept. 8, 1914. Filed Jan. 28, 1914. Serial No. 730,480.

**Miners' Auger.** J. Underaton, Hocking, Iowa, 1,104,231. July 21, 1914. Filed May 21, 1913. Serial No. 769,097.

**Mechanical Stoker**—A. G. Elvin, Somerville, N. J., 1,111,531, Sept. 22, 1914. Filed Feb. 24, 1913. Serial No. 750,124.

**Boiler Tube Cleaner**—F. Herle, Chicago, Ill., 1,104,262. July 21, 1914. Filed Dec. 10, 1913. Serial No. 805,700.

**Steam Generator**—A. A. Cary, New York, N. Y., 1,109,041, Sept. 1, 1914. Filed Oct. 26, 1911. Serial No. 656,798.

**Mining Machine Chuck**—F. Nugent, Mace, Idaho, 1,109,865, Sept. 8, 1914. Filed Sept. 23, 1913. Serial No. 791,381.

**Gas Producer**—T. B. Benner, Cortland, N. Y., 1,110,372, Sept. 15, 1914. Filed Mar. 21, 1914. Serial No. 826,369.

**Spark Extinguisher**—E. Thompson, Radnor, W. Va., 1,109,486, Sept. 1, 1914. Filed Aug. 16, 1913. Serial No. 785,181.

**Fire Box for Boilers**—J. M. McClellon, Everett, Mass., 1,111,266, Sept. 22, 1914. Filed Oct. 1, 1909. Serial No. 520,556.

**Underfeed Furnace**—R. S. Riley, Providence, R. I., 1,103,625, July 14, 1914. Filed Oct. 20, 1911. Serial No. 655,821.

**Water-Cooled Fire Bar**—R. Grabowsky, Hanover, Germany, 1,107,291, Aug. 18, 1914. Filed Sept. 4, 1912. Serial No. 718,457.

**Suction Gas Producer.** M. F. Derrick, Montreal, Canada, 1,107,917, Aug. 18, 1914. Filed June 12, 1913. Serial No. 773,309.

**Inclined Grate for Furnaces**—G. H. Thacher, Jr., Albany, N. Y., 1,109,266, Sept. 1, 1914. Filed Oct. 22, 1912. Serial No. 727,148.

**Mine Drilling and Channelling Machine.** L. J. Daft, Seattle, Wash., 1,108,342, Aug. 25, 1914. Filed June 23, 1913. Serial No. 775,270.

**Water Tube Boiler**—R. Delauney, Belleville, St. Denis, France, 1,109,627, Sept. 1, 1914. Filed Dec. 11, 1913. Serial No. 806,044.

**Automatic Stoker for Locomotives**—P. M. Thayer, Plymouth, Ind., 1,109,802, Sept. 8, 1914. Filed Mar. 6, 1913. Serial No. 752,313.

**Coal Conveyor.** J. Dodds and W. Brown, Cambuslang, Scotland, 1,104,481. July 21, 1914. Filed May 31, 1910. Serial No. 564,191.

**Grate Bar.** B. C. Stewart, assignor to Murphy Iron Works, Detroit, Mich., 1,107,860, Aug. 18, 1914. Filed Jan. 16, 1914. Serial No. 812,563.

**Mining Machine.** H. A. Kuhn and W. W. Macfarren, Pittsburgh, Penn., 1,107,239, Aug. 11, 1914. Filed Nov. 30, 1908. Serial No. 465,299.

**Automatic Stoker.** E. A. Jones, Scranton, and J. E. Jones, Troop, Penn., 1,107,217, Aug. 11, 1914. Filed Apr. 4, 1913. Serial No. 758,914.

**Adjustable Heat and Fuel Economizer.** M. M. Gilliam, Flushing, N. Y., 1,107,605, Aug. 18, 1914. Filed Feb. 20, 1914. Serial No. 819,912.

**Locomotive Fire Box Construction**—L. G. Parish, New York, N. Y., 1,100,815, Sept. 15, 1914. Filed June 15, 1914. Serial No. 845,079.

**Spark Arrestor and Smoke Treating Device**—H. A. Weber, Hartford, Conn., 1,109,884, Sept. 8, 1914. Filed Oct. 15, 1912. Serial No. 725,860.

**Mine Ventilating Apparatus.** W. Clifford, assignor to Elliott Co., Pittsburgh, Penn., 1,107,264, Aug. 18, 1914. Filed Jan. 4, 1912. Serial No. 669,329.

**Cutter Head**—L. F. Hess, assignor to Hess Dustless Mining Machine Co., Ansted, W. Va., 1,109,988, Sept. 8, 1914. Filed Nov. 9, 1912. Serial No. 730,480.

**Pyrophoric-Ignition Miner's Safety Lamp**—F. Fattinger, Treibach, Austria-Hungary, 1,109,055, Sept. 1, 1914. Filed Dec. 16, 1911. Serial No. 666,144.

**Boiler with Fire Tube Superheater.** S. Hoffman, assignor to Locomotive Superheater Co., Wilmington, Del., 1,104,756. July 21, 1914. Filed Jan. 12, 1912. Serial No. 670,734.

**Refractory Arch for Locomotive Boiler Furnaces**—C. B. Moore, assignor to American Arch Co., New York, N. Y., 1,109,692, Sept. 8, 1914. Filed Nov. 17, 1908. Serial No. 463,070.

**Bottom Construction for Furnaces.** H. H. Blake, assignor to Blake Crusher and Pulverizer Co., Pittsburgh, Penn., 1,104,402. July 21, 1914. Filed June 30, 1911. Serial No. 636,294.

**Process for Regulating the Temperature of Combustion**—J. M. Rusby and J. H. Taussig, assignors to United Gas Improvement Co., Philadelphia, Penn., 1,110,991, Sept. 15, 1914. Filed Dec. 27, 1909. Serial No. 535,178.

## PERSONALS

Fred Vinton has resigned his position as mine foreman for the Penn-Mary Coal Co. by which he has been employed for the past eight years, and has accepted a position as superintendent for the Greenwich Coal & Coke Co., at Saxton, Penn.

J. C. Arnold, general sales manager of the Interstate Coal & Mining Co., is pushing his sales campaign on the strength of the use of steam shovels in mining, which it is claimed produces a finer and cleaner coal than the ordinary system.

Col. W. H. Thomas and Jairus Collins of Bramwell, W. Va., together with N. D. Maher, vice-president of the Norfolk & Western R.R., are making arrangements for placing a creditable display of coal and coke from the Pocahontas coal fields at the Panama Exposition in San Francisco next year.

Benjamin S. Daddow, of Ashland, Penn., who has been employed as chief clerk of the Mahanoy and Shamokin Division of the Lehigh Valley Coal Co., has been promoted to the

position of chief clerk to Mining Superintendent Thomas Thomas, of the same company, with headquarters at the general office in Wilkes-Barre.

Miss Margaret Jordan has accepted a position as domestic science instructress, directress and helper, for all families of the employees of the Leckie Coal Co., the Panther Coal Co., and the West Virginia Pocahontas Coal Co. Miss Jordan is a graduate of Columbia University, and her new duties will be to visit the various operations at regular intervals, instructing the housewives in domestic economy, sanitation, teaching the children healthful recreation, and in every way assist in uplifting the communities in which her work lies.

## OBITUARY

Andrew A. Bruch, manager of sales for the S. Flory Mfg. Co. of Bangor, Penn., who has been with the company since its inception, died on Oct. 20.

Michael H. Healey, aged 45, a member of the Executive Board of District No. 1, United Mine Workers of America, and one of the best known union men in the anthracite region, died on Oct. 20, at his home, 431 Fourteenth St., Scranton, Penn., of kidney trouble.

Andrew Roy, the first mine inspector in Ohio, died at his late home at Wellston, Ohio, recently, from old age. He was 80 years old and a well known character in the mining industry of the state. The deceased was born in Scotland. He served in the Union army during the Civil War. After the war he was a candidate for secretary of state of Ohio but was defeated. He was appointed on a commission to investigate the condition of mining in Ohio and his report led to the establishment of the mine inspectors' department. He was appointed the first chief inspector on Apr. 6, 1874 which office he held for four years. On Feb. 12, 1880, he was re-appointed chief inspector by Governor Charles Foster and served for another four years.

## CONSTRUCTION NEWS

**Holospole, Penn.**—The Victor Coal Mining Co. of Holospole will shortly put into commission new equipment to operate its mine electrically.

**Middlesboro, Ky.**—It is announced that the Low Ash Mining Co. is to install electrically operated cutting and haulage machinery in its mines near here.

**New Orleans, La.**—The Illinois Central R.R. Co. recently awarded to the Roberts & Schaefer Co., of Chicago, a contract for a large barge loading plant to be built immediately at Harahan Incline, New Orleans.

**Charleston, W. Va.**—The Boone County Coal Corporation will shortly develop coal mines on Beach Creek, a tributary of Little Coal River. This firm will also build a tipple and establish a town, constructing two miles of railroad.

**Toledo, Ohio**—New coal docks, modern car dumping and coal hoisting machinery, and additional yards, all to cost more than half a million dollars, are to be added to the terminal facilities of the Cincinnati, Hamilton & Dayton R.R. in Toledo, within the next few months. The improvements have just been authorized, and preliminary surveys, plans and specifications are being worked out by the company's engineers.

**Chicago, Ill.**—The Roberts & Schaefer Co., of Chicago, has just concluded a contract with the Louisville & Nashville Ry. Co., for the equipment of a 1000-ton reinforced-concrete Holmen type locomotive coaling plant with weighing facilities, for installation at the new Radnor Terminal at Nashville, Tenn.

A contract was also concluded with the Louisville, Henderson & St. Louis Ry. Co. for the building of a similar tipple of 200 tons capacity, with proper weighing facilities at Henderson, Ky.

**Charleston, W. Va.**—A railroad will be built through the densely wooded portion of Nicholas County for the development of the natural resources in coal and lumber there found. The Cherry River Southern R.R. Co. has completed the permanent survey for the route of the proposed line, and will, it is expected, let the contract for the construction of the road at the earliest possible moment. This road will be about 35 miles long, and will extend from Curtin in Nicholas County, to Bay's Ferry, where the counties of Nicholas, Green-

Brier and Fayette converge. About 100,000 acres of valuable coal and timber land will be tapped by this road.

**Huntington, W. Va.**—What is believed to be the first step in a movement to utilize and turn to commercial advantage the water power afforded in the valley of the upper Guyandotte River is seen in the incorporation of the Logan Light & Power Co. of Logan, with an authorized capital stock of \$1,500,000. The incorporators of this firm are George W. Stevens, Jr., E. S. Aleshire, and R. P. Aleshire, of Huntington, Curtis McComas, of Barboursville, and W. C. Lawrence, of Logan. The intention is to erect a power house at Logan, and from that center distribute commercial current to the various mining operations in Logan County and throughout the Guyandotte Valley generally.

## NEW INCORPORATIONS

**Terre Haute, Ind.**—The Fairmount Coal Co. has been dissolved.

**Jersey City, N. J.**—The Mexican Coal & Coke Co. of Jersey City has decreased its capital stock as a New Jersey corporation from \$5,000,000 to \$50,000.

**Elberfeld, Ind.**—The Elberfeld Coöperative Coal Co. has been organized with a capital stock of \$2000, for the purpose of mining and dealing in coal. The incorporators are C. A. Wiggs, William Rostrom, and B. Fulling.

**Tacoma, Wash.**—The Scranton Coal Mining Co. has been organized in Tacoma with a capital of \$300,000. The incorporators are Ernest Hutchins, A. L. Hutchins, B. W. Watkins, and F. M. Lane; Eugene Carr is attorney.

**Listonburg, Penn.**—The Somerset Quemahoning Smokeless Coal Co. has been organized with a capital of \$10,000. The incorporators are J. H. Saulsberry, Eleanor M. Saulsberry, of Punxsutawney, John T. Harrington and Marion Harrington, of Horatio.

## INDUSTRIAL NEWS

**Birmingham, Ala.**—The Tennessee Coal & Iron Co.'s rail mill and open hearth department at Birmingham, which was closed Oct. 1, resumed operations on full time Oct. 22.

**Pittsburgh, Penn.**—Shipments of coal and coke over the Pennsylvania Lines east of Pittsburgh and Erie for September, show a total of 6,024,214 tons, or a decrease of 295,168 tons.

**Athens, Ohio**—Negotiations have been completed for a loan of \$100,000 by which the line of the Hocking-Sunday Creek Traction Co. will be extended to Athens. The loan was made by Close Bros., of Chicago.

**Bluefield, W. Va.**—During the month of September, the Norfolk & Western R.R. hauled 2,509,916 tons of fuel from the mines along its right-of-way. This was divided as follows: Pocahontas region, 1,390,531 tons; Tug River, 295,332; Thacker, 295,776; Kenova, 110,158; Clinch Valley, 158,393, and other Norfolk & Western territory, 4781 tons, the balance being received from other railroads.

**Fayetteville, W. Va.**—For the month of September, the Chesapeake & Ohio R.R. hauled 2,082,675 tons of coal from the Kanawha, New River, Guyan, and Kentucky districts. The Kanawha district furnished 709,535 tons, New River, 587,455 tons, Guyan, 555,445, and Kentucky, 230,200 tons. The Guyan district lacked only 32,000 tons of equaling the New River output hauled by the Chesapeake & Ohio.

**Scranton, Penn.**—It is reported that the city of Scranton pays more for its domestic fuel than is charged at tidewater, in spite of the fact that freight charges are added to the fuel shipped to these points. It is said that Scranton pays \$4 per ton net, without the cost of handling, while Paterson, N. J., for instance, gets the same grade of coal for \$3.35. It is alleged that complaint will be made to the State Utilities Commission.

**Washington, D. C.**—Freight rates on bituminous coal from mines in Washington County, Penn., to destinations on the Pittsburgh & Lake Erie and Baltimore & Ohio railroads in other states, were recently held by the Interstate Commerce Commission to be unreasonable and discriminatory to the extent that they exceeded by 10c. a ton rates for similarly located mines for the same destinations. This decision affects many roads and a considerable traffic.

**Clarksburg, W. Va.**—Announcement was recently made

that the Hygrade Coal Co. had leased its Page mine at McWhorter to J. S. Klinefalter & Co. These holdings consist of 150 acres of Pittsburgh coal, all of which is leased to the new corporation. The Page mine is modernly equipped, having been in full operation for some years, but it is stated that the lessees will continue to operate the mine on full time, and will probably make considerable improvement in the equipment.

**New York, N. Y.**—The local unions will petition President Wilson to effect a speedy settlement in the Colorado coal strike situation. Ernest Bohm, secretary of the Central Federated Union, recently received a telegram from a committee of the Trinidad coal strikers, asking the New York unions to petition the President to take speedy action in forcing the coal operators to comply with the requirements laid down as the basis of settlement of the Colorado coal strike.

**Washington, D. C.**—Reductions in the rate on coal from mines in Oklahoma and western Arkansas to Weatherford, Tex., were recently ordered by the Interstate Commerce Commission, in the case of the Weatherford Chamber of Commerce and others against the Missouri, Kansas & Texas and other railroads. The roads were directed to reduce from \$2.50 to \$2.25 per ton, the rate on lump coal, and from \$1.70 to \$1.65 per ton the rate on slack. These reduced rates are to take effect Dec. 1.

**Huntington, W. Va.**—The Chesapeake & Ohio Ry., including the C. & O. of Indiana, during last year used 41,000 carloads or 2,000,000 tons of fuel, for which \$2,220,000 was paid. By adding to this \$813,000 which it cost to transport this coal to the various points on the road, and \$85,000 which was spent by the company to put it on the tenders of locomotives, it will be seen that \$3,098,000, or \$1.55 per ton was spent by this railroad for fuel. This is equal to 8½ per cent. of the gross earnings of the road during this period.

**Washington, D. C.**—The Supreme Court recently agreed to review a decision by Federal Judge Dayton of West Virginia, since reversed by the Federal District Court of Appeals, holding that the United Mine Workers of America is a monopoly in restraint of trade. This decision was made in the case of the Hitchman Coal & Coke Co., which brought anti-trust proceedings against John Mitchell, T. L. Lewis, and William B. Wilson, as officers of the miners' union, and against the union itself. The company alleged that the organization was destroying its business.

**Washington, D. C.**—The case of the United States against the Lehigh Valley R.R. Co., the Lehigh Valley Coal Co., and the Lehigh Valley Coal Sales Co. has been set for argument Nov. 11, before Judge Hough in the Southern District Federal Court of New York. The Government brief which was recently filed contends that the Lehigh Valley R.R. Co., through its subsidiaries, has monopolized the production, transportation, and sale, of anthracite coal from mines along its lines, and asks the Court to compel the railroad company to dispose of the stocks of its subsidiaries to persons who are neither its stockholders nor agents.

**Frankfort, Ky.**—The Circuit Court of this (Franklin) County has upheld in toto the Workmen's Compensation act which was questioned in a test case given its preliminary hearing here recently. Judge Stout upheld the contentions of the State Board of Arbitration in every detail and granted the mandatory injunction which was asked by the Board against the printing concern which declined to comply with the provisions of law. The case went at once to the Court of Appeals and its hearing in that body will be expedited. In this connection it may be noted that the Board has extended the time for the employers to report the means they are going to use to comply with the act, from the first of November to the first of December. The coal operators of the state, who have favored the act all along, are well pleased with the turn affairs have taken.

**Connellsville, Penn.**—A suit of much interest to coke men of the Connellsville region was completed recently in the Superior Court of Massachusetts when J. K. Dimmick & Co., a former coke brokerage concern with offices in Uniontown and Philadelphia, was given the decision in a breach of contract action. The suit was brought against the Dimmick firm by the Federal Coal & Coke Co., whose offices are in Boston, and whose plant is at Fairmont. The concern sued to recover \$20,000. Breach of contract was alleged, it having been declared that the Dimmick firm contracted for 24,000 tons of coke, and refused to take the remainder after 500 tons had been shipped. A defense that the coke was of an inferior quality is said to have been made by the Dimmick concern, and a cross suit was brought to recover \$1200 or 5c. per ton commission on the deal. The court awarded the suit to the Dimmick company, giving it \$1200 with interest.

## Coal Trade Reviews

### General Review

**Cold snap starts the retail anthracite trade moving, but the mines continue short of orders. Bituminous outlook pessimistic. Cancellations the rule and mines are reducing working schedules.**

The recent cold snap has had a stimulating effect upon the retail anthracite trade, but with all dealers generally well stocked, it will have to continue for some time before the beneficial effect will be felt at the mines. Many of the large companies are already receiving cancellations, and a few have been forced to reduce their working schedules. The Upper Lake ports are reported as choked up with coal, though shipments are still substantially less than last season. The large amount of individual coal going to Tidewater is also indicative of the adverse situation. On the other hand, there is a notably healthy undercurrent through the trade, particularly as compared with average conditions in other industries.

Bituminous operators are distinctly pessimistic. In spite of the rigid curtailment, cancellations of orders are constantly threatening to develop heavy accumulations, and agencies are occasionally forced to make liberal concessions. Unsold portions of consignments to consuming centers are exceedingly difficult to move, and with heavy stocks in all directions, it is difficult to see where there can be any betterment. The improvement in some phases of the financial situation is creating renewed hopes in certain quarters.

Further curtailment in both general manufacturing and the iron and steel industries has created an additional heaviness in the Pittsburgh district. The customary fall advance in the circular is not being discussed, while the Lake shipping, which has been a disappointment throughout the season, has slowed up still further. Instead of an increased consumption, as is usually the case at this period, it seems to be falling off. Consumers are well stocked, but the mines are still urging coal forward, and some is occasionally noted on demurrage.

Ohio prices have softened under the influence of the continued weakness in domestic grades, the dull steam business and the falling off in Lake tonnage. Production has slowed down materially, and even in the event of cold weather it will be some time before the effects are reflected back to the mines. Some hopes of a final rush in the Lake trade are still entertained, reports from the Upper Lake ports indicating that considerable coal is moving to the interior.

The Middle Western operators have succeeded in relieving some of the pressure on slack coal by diverting a portion of the demand to straight mine-run. Prices on slack recently touched the lowest point in the history of the trade, but they are substantially better now. The general market continues heavy. There seems to be practically no demand whatever, and the past week has witnessed still further declines.

### ATLANTIC SEABOARD

#### BOSTON

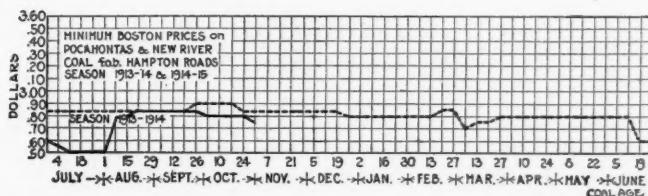
**Weakness in Hampton Roads coals likely to be more pronounced. Inland demand now as slack as Tidewater. Pennsylvania grades also somewhat off in price. Anthracite only in light demand and independent offerings again in evidence.**

**Bituminous**—The week has developed some soft spots in the Pocahontas and New River market; several of the agencies have quietly been offering coal at a liberal concession from the \$2.85 price. This condition is not widespread as yet, but it is certainly significant. Unless present indications fail, there will be a general slump in Hampton Roads coals by the early part of November. The usual effort is being made to cover up the f.o.b. basis of such sales as are effected, and so far the low-priced offerings are confined to alongside business at points like Boston, Providence and Portland. Only a rigid curtailment can correct the present state of the market. The extremely mild weather has not only reduced coal consumption, but transportation has been moving on

record time, and practically every point is surfeited with supplies.

For inland delivery, there is practically no inquiry. At Mystic Wharf, Boston, the season price of \$3.78 on cars is still quoted, but it is doubtful if a price 50c. less would be attractive enough today to make a sale of any considerable tonnage. At Providence, \$3.40 on cars has been named, a figure that would analyze back to \$2.62 f.o.b. Hampton Roads, based on the lowest marine freight. Unsold balances continue to keep the market weak, and with the heavy stocks everywhere, it is difficult to see how there can be any improvement for weeks to come.

The Pennsylvania grades are also showing the effect of the dull market. Most of these coals, however, are sent to the loading ports only on firm orders, and there is nothing like the proportion of distress coal at New York and Philadelphia that prevails at the Virginia terminals. At the same time, prices have had to be modified in many instances to secure any orders at all.



There are no new developments on Georges Creek. The shippers are caught up on their contracts and new business on this coal is as much out of the question as on any of the other standard grades.

**Anthracite**—The retail dealers complain of exceptionally light business. There has been no weather to burn coal, and stocks continue at the maximum in most cases. Shipments have fallen off very noticeably and loading dispatch at New York has correspondingly improved. One of the signs of a dull market is the offering of various independent coals at Boston and points East at prices a few cents under the company circular. The difficulty with independent shippers, as with others, is that they cannot furnish the proportion of stove coal required, and egg and chestnut are a drug on the market.

Bituminous prices at wholesale are about as follows:

	Clearfields	Cambrias	Georges Creek	Pocahontas New River
Mines*	\$0.85@1.45	\$1.20@1.55	\$1.67@1.77	
Philadelphia*	2.10@2.70	2.45@2.80	2.92@3.02	
New York*	2.40@3.10	2.75@3.10	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.75@2.85
Boston†				3.50@3.75
Providence†				3.40@3.75

\* F.o.b.      †On cars.

#### NEW YORK

**Working schedules in the bituminous field are much reduced. Outlook pessimistic. Anthracite operators curtailing production though the recent cold snap has improved conditions.**

**Bituminous**—The market outlook continues distinctly pessimistic. A particularly adverse development of the week was a well defined rumor of a substantial cut in the circular on New River coal. The working schedules in the mining regions have contracted still further; it is unofficially stated that the Berwind-White interests have reduced to a two- or three-day basis per week, the two-day schedule probably predominating. Many of their miners are seeking employment in other fields, and in fact this is becoming so general throughout all the mining regions that the situation is rapidly becoming distressing.

But even in the face of all these adverse conditions features of a constructive nature are not entirely absent. The rapid decline in the rate of exchange down to a more normal basis, together with other favorable developments, such as the more hopeful outlook in cotton, are expected to have a steady effect. There is no absolute pressure to sell at Tidewater, accumulations being relatively restricted and no demurrage coal reported. The demand from tramp steamers is holding up in a most satisfactory manner.

Prices are irregular and are showing weakness, though the market is still quotable on the former basis which we continue as follows: West Virginia steam, \$2.50@2.60; fair grades Pennsylvania, \$2.55@2.65; good grades of Pennsylvania, \$2.70@2.80; best Miller Pennsylvania, \$3.10@3.15; Georges Creek, \$3.15@3.25.

**Anthracite**—A sharp cold snap during the current week had a much needed stimulating effect upon the markets which were showing a decided tendency toward heaviness. Some of the large companies, as, for instance, the Reading, had already been forced to curtail operations, while practically all were receiving cancellations. The line trade all over the country has shown a distinct falling off, while the amount of individual coal coming to Tidewater is sufficient indication of the slowing up at interior points. It is generally agreed that the local dealers are all well stocked up, and it will probably take a long spell of cold weather before the trade will get back to a satisfactory basis. On the other hand, however, the situation is not by any means as bad as might be expected, considering conditions in general.

Egg coal is still in excess supply in all directions. Stove coal is becoming more plentiful all the time, straight cargoes being readily obtainable. Nut is only fair, and pea coal about the same. Steam sizes are heavy and difficult to move.

The New York hard-coal market is now quotable on the following basis:

	<b>Upper Ports</b>		<b>Lower Ports</b>	
	Circular	Individual	Circular	Individual
Broken	\$5.10	\$4.65@5.10	\$5.05	\$4.60@5.05
Egg	5.35	5.00@5.35	5.30	4.95@5.30
Stove	5.35	5.35	5.30	5.30
Chestnut	5.60	5.50@5.60	5.55	5.45@5.55
Pea	3.55	3.45@3.55	3.50	3.40@3.50
Buckwheat	2.80	2.50@2.80	2.75	2.25@2.75
Rice	2.30	2.05@2.30	2.00@2.25	1.60@2.25
Barley	1.80	1.70@1.80	1.75	1.50@1.75

#### PHILADELPHIA

**Cooler weather creates some improvement in anthracite, but operations are curtailed. Small sizes still in surplus. Demand for domestic is absorbing current output.**

**Anthracite**—The past week was more seasonable, but did not have the snap that indicates the trade has reached the point where uninterrupted operation of the mines may be expected. Mitchell Day was celebrated by a complete cessation of mining, and it is understood that several of the large companies were idle for an additional day or two. It is the heaviness in the small sizes that is interfering with a larger production of the domestic grades. The market appears to absorb the current output of broken, egg, stove and nut, but even the inducement of substantial concessions on the steam sizes finds little response from the trade. Everyone is complaining of the unsatisfactory conditions, and the consensus of opinion seems to be that nothing but good coal-burning weather, and plenty of it, will add backbone to the trade.

Prices at Tidewater rule about as follows:

	<b>Circular</b>	<b>Individual</b>
Broken	\$4.75	\$4.50 @ 4.60
Egg	5.00	5.00
Stove	5.00	5.00
Chestnut	5.25	4.90 @ 5.10

**Bituminous**—There is practically no change in the bituminous situation. If anything, the past week has been less fruitful in the way of new business and requisitions for tonnage on contracts. Industrial curtailment has caused quite a number of cancellations, or postponed deliveries, and it is quite apparent that manufacturers are not laying in any more supplies than will be sufficient for their immediate needs. The market is such that no stated price can be used as a basis for coal from any particular district. Coal on demurrage is likely to be disposed of at figures which will hardly net the freight, and it is understood there is quite an accumulation at Tidewater points, some of which is approaching the danger line. On all sides comes the same story, and it is difficult to find an operator with a cheerful outlook for the future.

#### BALTIMORE

**All branches of the coal business unsatisfactory. Extremely low prices for soft coals. Anthracite demand poor. No great industrial resumption now expected.**

There is little of a satisfactory nature in the present coal situation here and the same condition seems to exist everywhere else. The operating interests of this section are facing a number of problems. Even at reduced time and with many mines closed entirely, a surplus is constantly threatened through cancellations from consumers who ordinarily take a large amount of fuel at this season.

In West Virginia, good fuels, such as three-quarter gas and first grade steam coals, were offering to the trade at anywhere from 80 to 90c. Slack was selling around 40c. Western Maryland steam coals sold seriously to the trade

at the mines at from 75 to 85c. Pennsylvania low-grade fuels were offering anywhere from 85c. to \$1, with better grades at \$1.05 to \$1.15, and best coals of the state around \$1.35. But it was hard to sell even at such sacrifice figures, in many cases considerably below actual production expense.

The entire situation seems to be due to the poor industrial call. The trade has now resigned itself to the situation and does not look for an early resumption of activity.

Anthracite conditions are none of the best. With no real cool weather, there is a flat period in the trade, now that summer deliveries have been closed out for some time.

The export trade continues to hold up fairly well. A number of Mexican charters were noted among the recent announcements.

#### HAMPTON ROADS

**Some improvement in foreign movement. Prices stationary, with slightly above normal quantity of coal on hand.**

Although shipments from Hampton Roads to foreign ports have not been exceptionally heavy, at the same time there has been a decided improvement over last week's movement. Some large cargoes have gone to New England ports and the government has taken in the neighborhood of 15,000 to 16,000 tons into colliers. The largest percentage of coal moving has been Pocahontas and New River mine-run, although there have been several cargoes of high volatile and nut and slack shipped.

The accumulation of coal in the railroad yards is still above normal, with fair shipments en route from the mines. Quite a large tonnage is due at the various piers, and with the vessels now in port the accumulation will be considerably reduced. Quotations are about the same as they have been during the last few weeks. Owing to the warm weather, the domestic demand is light and dealers are complaining of poor sales.

Of the foreign steamers tied up in Hampton Roads at the outbreak of the war, all, with the exception of two, have cleared and left for various loading ports. During the week the Virginian Ry., at Sewalls Point, did excellent work in the bunkering of the "Anglo Saxon" and "Anglo Columbian," approximately 2500 tons of bunkers being put aboard the latter steamer in the short time of seven working hours.

Of 13 steamers reported to have been sunk by the German cruiser "Karlsruhe," over half of them have been either loaded or bunkered at some time at one of the Hampton Roads ports.

The following cargoes have cleared from Norfolk and Newport News, between Oct. 16 and 23, inclusive:

<b>Norfolk</b>			<b>Newport News</b>				
Date	Vessel	Tons	Destination	Date	Vessel	Tons	Destination
16	Frankrig	2253	Barbadoes	16	Auchendale	6218	Havana
17	Trodenkjold	5560	Canal Zone	17	Ella	2047	Santiago
	Berwindvale	7938	Havana	17	Ekaterini	5432	Brindisi
21	Santa Isabel	3006	Havana	17	Leonatus	3131	Port au Spain
22	Noordijk	4467	Bahia	17	Josef Fredrik	2964	Havana
23	Homewood	2335	Santa Fe (AR)	17	Amista	6044	Montevideo
23	Chimu	2676	Chilian Ports	20	Gemma	4875	Brindisi
23	Tasmania	5268	Spezia	23	Westerdijk	4332	Montevideo

#### COAL CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

<b>Vessel</b>	<b>Nationality</b>	<b>From</b>	<b>To</b>	<b>Tons</b>	<b>Rate</b>
Karen	Norwegian	Baltimore	Colon	1072	
Rio Blanco	British	Philadelphia	Rio Janeiro	2580	
Haakon VII	Norwegian	Baltimore	Tampico	1379	
Biemiller		Philadelphia	Porto Rico	858	
Alicia B. Crosby		Philadelphia	Portland	1016	
Winnegance		Philadelphia	Lubec	251	
J. Howell Leeds		Philadelphia	Gloucester	393	
Margaret		Philadelphia	Porto Rico	1236	
John A. Hooper		Baltimore	San Francisco	1321	
Sophie H.	Dutch	Virginia	Rio Janeiro	1864	

Note—Steamers are indicated by **bold face** type, all others being schooners.

## LAKE MARKETS

#### LAKE TRADE

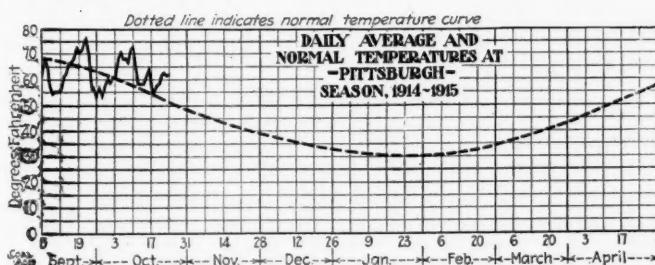
No season in Lake trade has ended as dismally as the present one. Ordinarily there are very fine finishes in the trade owing to the desire of shippers to have their commodities moved before navigation becomes impossible. Nothing of the sort, however, characterizes the present season. Shippers some time ago began to send their own vessels to dock owing to their inability to provide them with cargoes. —"The Marine Review."

#### PITTSBURGH

**Lake shipments still lighter and will soon end for the season. Line demand slightly less. Prices irregular and practically unchanged, except for rather less irregularity in slack.**

Lake shipments have decreased further and the movement will soon be over. The demand from the Northwest has

been an almost continuous disappointment throughout the season, and the last hopes of an improvement have, of course, disappeared. Manufacturing demand has shown a slight decreasing tendency in the past week or two, as the iron and steel mills are operating at still lower rates, one estimate having it that last week the steel mills as a whole operated at only 45% of capacity. Domestic trade shows a slight improvement, but retail dealers are still ordering in as small quantities as possible.



Prices are as low and irregular as ever, even slack showing no decided strengthening in keeping with the decreased output of screened coal and the fact that Lake shipments of  $\frac{3}{4}$ -in. coal will be entirely finished in a very few weeks. Slack is quotable this week at about 50c. as minimum, against 40@50c. last week. Best grades of gas coal, in prompt lots, command in the neighborhood of \$1.15, but there are occasional lots offered down to about a dollar. Nothing definite can be learned as to new circular prices, which, according to custom, should shortly be announced. The old circular, still nominally or officially the market, is: Slack, 90c.; nut and slack, \$1.05; nut, \$1.25; mine-run, \$1.30;  $\frac{3}{4}$ -in., \$1.40;  $1\frac{1}{4}$ -in., \$1.50, per ton at mine, Pittsburgh district.

#### BUFFALO

**Still much complaint of unseasonable weather, and anthracite trade is sure to be affected soon. Bituminous accumulating on track everywhere. Grave outlook when the Lake trade is shut off.**

**Bituminous**—There is not much chance of improvement in any branch of the coal trade so long as the present weather continues. There is as much coal in consumers' hands as they want to carry and the mines are still urging it forward, often paying demurrage on it, when they ought to be realizing all the profit they can. The jobbers say that if there is demurrage to pay, the mines will have it to settle. Reports come from the mines that they are able to run only three or four days a week at the most, and quite often less than that. This is the time of the year when the consumption of bituminous ought to increase steadily, but it appears to be falling off instead. Complaints of poor trade multiply. Iron furnaces continue to shut down and mines run more slowly. Canada is buying so little that some shippers say there is hardly an excuse for covering it, except to keep acquainted with their old customers. Quotations continue unchanged, though all prices are weak, slack especially so, on the basis of \$2.80 for Pittsburgh lump, \$2.70 for three-quarter, \$2.55 for mine-run and \$2.15 for slack. Allegheny Valley coal is about 25c. below Pittsburgh, except slack, which is about on a par with it.

**Anthracite**—The demand is fair, but in no way as rushing as it sometimes is. It is not believed that there is any disposition to cut down the amount required, so the quietness is acceptable to the wholesalers, though the local dealers are complaining about it some.

Shipments by Lake are fairly good, though not what they were last fall. Shipping agents say that they are sure of coal enough at Upper Lake ports, and there is no need of haste. It is reported that sales at Upper Lake ports are not active, and more will be necessary if further shipments are to be made from here, as storage room is practically all taken up. The amount shipped for the week, according to custom house figures, is 139,000 tons, which is a fair fall average.

Rail line shipments of anthracite are improving and should continue to do so for some time.

#### TORONTO, CAN.

**Market well supplied and business quiet. Prices steady.**

Owing to the continuance of mild weather, the coal trade remains unusually quiet for the season. The market is well supplied and large consignments are being received by dealers in anticipation of the close of navigation. There is no change in prices, quotations being well maintained as follows: Retail—Anthracite, egg, stove and nut, \$7.75; grate, \$7.50; pea, \$6.50. Bituminous, steam, \$5.25; screenings, \$4.35; domestic lump, \$6; cannel, \$7.50. Wholesale, f.o.b. cars, three-quarter lump, \$3.78; screenings, \$2.64.

#### TOLEDO

**Situation continues unchanged and generally heavy. Closing of domestic mines creates a shortage of small sizes.**

Conditions have changed but little, domestic demand still being light, while steam coal is moving slowly as compared with other years. Owing to the fact that many Hocking domestic mines are closed down altogether, nut, pea and slack are showing more strength. Lake business is unchanged. The T. & O. C., C. H. & D. and Hocking docks are all moving some coal, and the C. H. & D. is making a better showing than it did a year ago.

Railroad movement continues light and there is no congestion noted here. The uplake coal handled thus far this season by the C. H. & D. here amounted to 1,000,000 tons, and the company officials are predicting that the season's tonnage will reach 2,350,000 tons.

#### COLUMBUS

**Curtailed production due to falling off in domestic demand. Steam business slow and Lake trade is not so active. Prices have weakened.**

The feature of the coal trade in Ohio is the continued weakness in domestic grades, which has curtailed production. This, coupled with the dull steam business and a falling off in Lake tonnage, has had a bad effect on the trade generally. Prices have softened materially and the tone of the market is not as good as formerly. These conditions are believed to be only temporary, however, and a turn for the better is expected as soon as lower temperatures prevail.

Dealers' stocks are sufficient for present needs, and they are only buying a small amount. Cancellations have been frequent. Buying is now being done for delivery in the first half of November. There is no likelihood of an advance soon and \$1.75 coal is now out of the question before the first of the year. Retailers say there is still a fairly good demand for the fancy grades, such as Pocahontas and West Virginia splints. Hocking lump is also moving fairly well.

Little change is reported in the steam trade. Manufacturing is still quiet, and there has been practically no increase in fuel requisitions. Buying in the open market is still the rule among certain factories. Railroads are only taking a fair tonnage, and the prospects for the future are not considered bright.

The Lake trade shows a slight falling off, due to congestion at some of the upper Lake docks, but this condition is being relieved and a fairly good movement is expected right up to the closing of navigation. Lake prices have not changed materially and shipments to the interior are heavier. Production has been slackened during the week and the Hocking Valley is now producing only about 45% of the average. The same percentage prevails in Crookville, Jackson and Cambridge districts. In the Pomeroy Bend district, the output is estimated at about 70 to 75% of normal.

Anthracite is in fairly good demand among the trade and prices are as high as formerly.

Prices in the Ohio fields are:

	Hocking Valley	Pomeroy	Kanawha
Re-screened lump.....	\$1.60	\$1.70	
Inch and a quarter.....	1.50	1.50	\$1.40
Three-quarter inch.....	1.40	1.40	1.35
Nut.....	1.15	1.30	1.15
Mine-run.....	1.10	1.15	1.10
Nut, pea and slack.....	0.50	0.55	0.50
Coarse slack.....	0.40	0.45	0.40

#### CLEVELAND

**Sharp fall in temperature has stimulated the retail trade. Prices are generally stiffer and there is a better tone to the market.**

Colder weather that has forced heating plants to fire up, brought a liberal lot of orders to the retail dealers Monday. This was the first real fall business of the season and it has had a most beneficial effect since the local trade depends upon one- and two-ton lots for more than half of its business. The increased reail trade did not affect the wholesale market and will not before the latter part of the week, but the weather had a bracing effect upon spot car business. Coarse coals moved readily and fine coal was in brisk demand. This brought a stiffening in prices and some slight advances in certain lines.

Youghiogheny slack was sold at \$1.70 with Panhandle at \$1.60 to \$1.65. Fairmount slack, which has been very low for several weeks, was up to \$1.65 and operators were not cutting the price for orders for shipment. Hocking and Goshen slacks are not being offered, as the lighter production of larger sizes has so reduced the output of these grades that there is only sufficient for contract requirements. No. 8 from West Virginia has been sold largely on consignment the last few weeks, but it brought quoted prices in sympathy with other coals. For the first time this fall the

market looks as if it would continue to hold above the rock bottom level at which it has been so frequently during the last few months.

The Lake trade is rapidly drawing to a close. Only such cargoes as are needed to round out contracts are being shipped. It does not seem likely that any considerable amount of coal will be moved during the rest of the season and practically no coal will go up the Lakes after Nov. 15.

Prices for current shipment are as follows:

	Pocahontas	Youghio-	Bergholz	Fair-	W. Va.
		gheny		mount	No. 8
Lump.....	\$3.75	.....	.....	.....	.....
Lump, 6 in.....	.....	.....	\$2.45	.....	.....
Egg.....	3.75	.....	.....	.....	.....
Egg, 6 in.....	.....	.....	2.10	.....	.....
Lump, 1/2 in.....	.....	\$2.40	2.25	.....	.....
Lump, 1 in.....	.....	2.30	2.10	\$2.05	\$2.05
Mine run.....	2.75	2.25	1.95	1.90	1.95
Slack.....	2.40	1.65@1.70	1.65	1.65	1.65

#### CINCINNATI

**No change noted and the demand continues light. Colder weather will make some improvement. Transportation and labor conditions are excellent.**

The continued mild fall weather and the lack of any improvement in the industrial demand has resulted in about as dull a market as possible. The hoped-for improvement among manufacturers has not yet taken place, although there are encouraging signs that it may develop in the near future. So far, however, the better feeling has not made itself evident in an increased demand for fuel, which must evidently await a decided increase in the extent of operations.

The domestic market, as far as the storage demand is concerned, is generally understood to be about filled, but there is undoubtedly a large volume of business to be handled in one-ton orders when the first cold snap comes. It is not likely, however, that even colder weather will help much for some time, as the retail trade is well stocked.

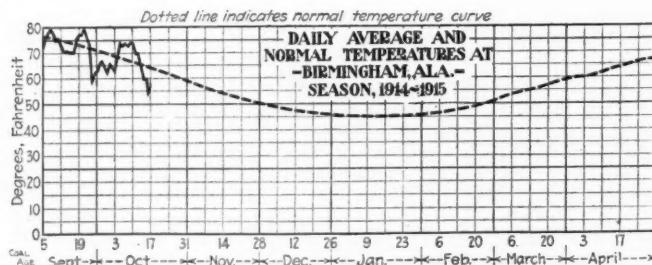
#### SOUTHERN

##### LOUISVILLE

**Market generally demoralized. Still large excess of slack. Mining slowing down.**

Generally speaking, the Kentucky coal market is demoralized by the weather and the curtailment in industrial operations. The extent to which it has been affected is shown by the fact that many of the mines which produce the fancy and the advertised brands of domestic coal are now selling these for steam use. In addition to this, some operators are dumping their nut and slack on the ground in order to dispose of it. Such mines have large contracts to fill in domestic coals and have to get it out, but they have been unable to dispose of their steam grades. The railroads are profiting to a considerable extent, having much steam coal turned over to them for the demurrage and freight charges.

Mines are slowing down on production and this is tending to strengthen the domestic market, in which prices are more or less steady. It is not common, however, for operators to get business at prices which are at all reasonable, while almost anything that looks like real money for steam coals gets the order.



#### COKE

##### CONNELLSVILLE

**Small furnace coke contract closed at \$1.75, the highest regular asking price. Market quiet. Production and shipments further decreased.**

A contract for a relatively small monthly tonnage of furnace coke, to run to the end of the year, has been closed

with an eastern Pennsylvania consumer at \$1.75, ovens, practically the highest price now seriously quoted. There are negotiations for one or two lots for November shipment only, on which \$1.75 or less will be done, as there are sellers of some brands for early delivery at as low as \$1.65. Prompt coke shows scarcely any activity, and there are offerings at \$1.60, but these cover only occasional lots, not regular supplies. Foundry coke is easier as to prompt lots, there being fairly good brands available at \$2.15, while indifferent grades could be had at \$2, or possibly a shade less. We quote: Prompt furnace, \$1.60; contract furnace, \$1.65@1.75; prompt foundry, \$2.15@2.50; contract foundry, \$2.35@2.50, per ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Oct. 17 at 237,729 tons, a decrease of 8381 tons, and shipments at 236,109 tons, a decrease of 8484 tons.

#### BUFFALO

**The oven output still shows a falling off. Prices at rock bottom, with little prospect of any improvement.**

There is no upturn yet to the coke market. Coal dealers are discouraged and are giving coke a wide berth. So many furnaces are idle that the prices are controlled by the consumers, which means that they are at the bottom. All reports from the oven districts agree that the output is not increasing, and in many cases it is falling off. Prices remain on the basis of \$4.25 for best 72-hr. Connellsville foundry, with \$3.30 for stock coke.

#### MIDDLE WESTERN

##### INDIANAPOLIS

**A better price for screenings. Operators selling mine-run in place of steam lump.**

The only feature in the Indiana coal situation that is changed is a better price for screenings. The minimum price now seems to be 40c., as against 30c. the last several weeks. Operators are not sure about the influences that have brought this about, but they feel that they themselves have been a factor. They managed to induce some railroads and other large buyers to switch from lump to mine-run, and they are apparently satisfied with the change. This, together with a less pressing demand for domestic lump, has reduced the accumulation of slack, with the result that there is less now on the open market, and buyers have had to bid higher for it. It had sold down to 25c., the lowest in the history of the Indiana field. A year ago screenings were selling at 75c. and 80c. Operators are still of the opinion that the Keokuk dam has something to do with the generally lessened demand for coal. The consumption cut off by the great water power has to be sought elsewhere and competition is sharpened. Mining and retail prices are generally unchanged and mines are on half time. Summer weather still prevails.

Retail prices are as follows:

Anthracite, chestnut.....	\$8.25	Raymond, lump.....	\$4.50
Anthracite, stove and egg.....	8.00	Winifred, lump.....	4.50
Anthracite, grate.....	7.75	Hocking Valley, lump.....	4.50
Pocahontas, forked lump.....	6.00	Luhrig lump.....	4.50
Pocahontas, shovelled lump.....	5.50	Luhrig washed egg.....	4.75
Pocahontas, mine run.....	4.50	Cannel.....	6.00
Pocahontas, nut and slack.....	3.75	Linton No. 4 lump.....	3.50
Blossburg.....	5.50	Linton No. 4 egg.....	3.50
Jackson (Ohio).....	5.25	Sullivan No. 6.....	3.50
Kanawha, lump.....	4.50	Indiana washed egg.....	3.50
Kanawha, egg and nut.....	4.25	Brazil block.....	4.50
Pittsburgh, lump.....	4.50	Connellsburg coke.....	6.00

##### ST. LOUIS

**A declining market. Mild weather and practically no demand. Outlook generally discouraging.**

There has been a continually declining market during the past week, both as to prices and demand. An unusually mild month thus far has upset all the expectations of the coal trade, and everything seems to have gone wrong. There is practically no demand in the city for coal in a domestic way, and steam business is off about 50 per cent. In some respects, this is due to a general business depression, and also to the mild weather. It is customary, at this season, to ship a large tonnage to the South for cotton gins, etc., but the movement this year is slow.

The situation is particularly bad in the Standard districts, where screenings have been selling for as low as 10c. and lump for \$1. The only relief is cold weather and plenty of it, and even this may not bring the market into the condition it ought to be at this period of the year.

Anthracite still continues in fairly good demand, with nothing moving in the way of smokeless.

The prevailing circular is:

Williamson and Franklin Co.	Big Muddy	Mt. Olive	Stand- ard	Sparta
2-in. lump.....	.....	\$1.30	\$1.05@1.15	\$1.15@1.20
3-in. lump.....	.....	1.40	.....	.....
6-in. lump.....	.....	1.50	1.25@1.35	1.30@1.35
Lump and egg.....	1.85@2.15	\$2.25	.....	1.35
No. 1 nut.....	1.25@1.40	.....	0.75@0.80	.....
Screenings.....	0.25@0.40	.....	0.80@0.85	0.10@0.20
Mine-run.....	1.05@1.10	.....	.....	0.20
No. 1 washed nut.	1.50@1.60	2.25	1.50	.....
No. 2 washed nut.	1.20@1.30	.....	1.35	.....
No. 3 washed nut.	1.05@1.10	.....	.....	.....
No. 4 washed nut.	1.00@1.05	.....	.....	.....
No. 5 washed nut.	0.15@0.25	.....	.....	.....

#### KANSAS CITY

Coal has been moving slowly, both for domestic and steam plant use. Winter season is late.

The seasonal movement of coal in Kansas City continues to be postponed, due to the delayed winter. Before the middle of October last year, there had been two weeks of really cold weather, but this year there has not been even a frost. Domestic prices are generally unchanged, as are steam grades also, and unless sufficiently prolonged cold weather comes soon, there will be a break in the market for slack. There are no large stocks of coal on hand with either dealers or consumers. Illinois sales have fallen off markedly from the previous week, and there is considerable coal now threatened with demurrage.

#### Coal Contracts Pending

**Contract No. 2—Norfolk, Va.**—The United States Government is in the market for 200 tons of bituminous coal for use in waterway improvement work. Bids opened Oct. 12 were as follows: Pocahontas Fuel Co. (14,850 B.t.u.), \$2.63. Castner Curren & Ballitt, (14,600 B.t.u.), loading at city pier: Lump, \$3.545; mine-run, \$2.545; for loading at Lamber's Point: Lump, \$3.545; mine-run, \$2.59. New River Coal Co. (14,800 B.t.u.), \$2.55. Smokeless Fuel Co. (14,800 B.t.u.), \$2.53. C. G. Blake Co. (14,850 B.t.u.), \$2.55. Nottingham & Wrenn Co. (14,800 B.t.u.), \$2.58. Chesapeake & Ohio Coal & Coke Co. (14,850 B.t.u.), \$2.59 trimmed and \$2.57 not trimmed. Johns Bros. (14,800 B.t.u.), \$2.53. All communications should be addressed to E. Eveleth Winslow, Lieutenant Colonel of Engineers, United States Engineer Office, Norfolk, Virginia.

**Contract No. 4—Boston, Mass.**—Rhode Island Co. is in the market for 90,000 to 100,000 tons of Pocahontas, New River, Georges Creek, or Somerset run-of-mine. Shipments are to be made in about monthly proportions for a year, and the point of delivery is Providence, R. I. All communications should be addressed to E. H. Raquet, Engineer of Tests, South Station, Boston, Massachusetts.

**Contract No. 6—New York**—The Connecticut Co. is in the market for 22,000 tons of a good grade, low volatile, low ash, low sulphur bituminous coal for 10 months, Nov. 1, 1914 to Sept. 1, 1915. Shipments are to be as required f.o.b. boats, to be placed by the company at New York loading ports. Bids should be submitted to J. H. Sanford, Purchasing Agent, New Haven, Connecticut.

**Contract No. 7—Zylonite, Mass.**—The Berkshire Street Railway Co. is in the market for 21,000 tons of a good grade, low volatile, low ash, low sulphur bituminous coal for 10 months, Nov. 1, 1914 to Sept. 1, 1915. Shipments are to be as required and price to be made f.o.b. cars at mines for Tunnel Power plant at Zylonite, Mass. B. & A. R.R. Bids should be submitted to J. H. Sanford, Purchasing Agent, New Haven, Conn.

#### CONTRACTS LET

**Contract No. 5—Boston, Mass.**—The New York, New Haven & Hartford R.R. closed a fuel contract this week of about 350,000 tons for delivery at Boston and at Providence with the New England Coal & Coke Co., it is understood, on Davis Coal & Coke Co.'s Elk Garden coal.

#### FOREIGN

**Guayaquil, Ecuador, South America**—La Compania de Alumdrado (Lighting Company) is in the market for 3500 tons of gas coal. Prospective bidders should state the specific gravity, weight per cubic foot, and space occupied by one ton of gas coal. Give approximate analysis including moisture, fixed carbon, sulphur and ash, and a commercial analysis showing the gas per ton of coal, gas per cubic foot of coal, illuminating power of the gas in standard sperm candles, value of one cubic foot in grains of sperm, sperm value per ton of coal, coke per ton of coal (good quality), coke per cent. of coal, ash in coke, sulphur eliminated with the volatile prod-

ucts, sulphur in the coke, tar per ton of coal. Quotations should be c.i.f. Guayaquil. Address The Manager, Compania de Alumdrado, Guayaquil, Ecuador, South America.

**South America**—An American consular officer in that country has transmitted detailed information relative to tenders which will be received, until Nov. 1, for the supply of coal for government steamer service. American coal dealers who are interested should apply to the Bureau of Foreign and Domestic Commerce, mentioning item No. 14,016 for the reserved information.

**South America**—Supplementing a previous notice, the Bureau of Foreign and Domestic Commerce at Washington states that details regarding a certain inquiry from South America have been forwarded to the department, and that complete information, including blank forms on which to submit bids for supplying coal under the conditions specified can be had on application. All inquiries should mention item No. 14,048, and be addressed to the Bureau of Foreign and Domestic Commerce, at Washington, D. C.

**Santiago, Chile, S. A.**—Bids are wanted on 300,000 tons of coal a year during the next three years, according to press reports. The coal is to be used on the Chilean Railway. All communications should be addressed to the Department of Materials, Santiago, Chile, S. A.

**Latin America**—An American minister in Latin America has transmitted, by telegram, information relative to the coal market in his district. Full particulars may be had on application to the Bureau of Foreign and Domestic Commerce and its branch offices, referring to item No. 14,133.

#### PRODUCTION AND TRANSPORTATION STATISTICS

##### NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during September and the past four months of the current year in short tons:

	June	July	August	September
Pocahontas Field.....	1,245,440	1,314,478	1,277,621	1,390,531
Tug River District.....	244,342	263,240	293,179	295,332
Thacker District.....	261,248	288,643	286,572	295,776
Kenova District.....	97,352	100,600	105,724	110,158
Clinch Valley District.....	156,028	140,751	134,408	158,393
Other N. & W. Territory.....	2,337	2,735	4,211	4,781
Total N. & W. Fields.....	2,006,747	2,110,447	2,101,715	2,254,971
Williamson & Pond Creek R.R. ....	76,822	90,819	91,813	85,053
All other railroads.....	232,387	301,796	257,280	169,892
Grand total.....	2,315,956	2,503,062	2,450,808	2,509,916

Distributions of shipments for August and September compare as follows:

	August	September				
	Shipped	Tipple	Total	Shipped	Tipple	Total
Pocahontas.....	1,208,245	14,573	1,222,818	1,225,197	16,952	1,242,149
Tug River.....	289,223	3,956	293,179	292,570	2,762	295,332
Thacker.....	232,234	9,377	241,611	246,980	9,057	256,037
Kenova.....	94,494	11,230	105,724	99,941	10,217	110,158
Total.....	1,824,196	39,136	1,863,332	1,864,688	38,988	1,903,676

Shipments of coke, entirely from the Pocahontas field, amounted to 58,266 tons in August as compared with 18,734 tons in September.

Destination of shipments over this road for September and the first nine months of this year and last year were as follows in short tons:

	September	Nine Months		
	1913	1914	1913	1914
Coal				
Tidewater, foreign.....	107,814	334,205	1,236,387	1,587,552
Tidewater, coastwise.....	295,402	347,571	2,892,968	2,917,784
Domestic.....	1,911,662	1,828,140	14,323,918	15,474,771
Coke				
Tidewater, foreign.....		142	27,199	339
Domestic.....	137,204	58,970	1,204,236	807,104
Total.....	2,452,082	2,569,028	19,684,708	20,787,550

#### PENNSYLVANIA R.R.

The following is a statement of shipments over the P. R. R. Co.'s lines east of Pittsburgh and Erie for September and nine months of 1913 and 1914, in short tons:

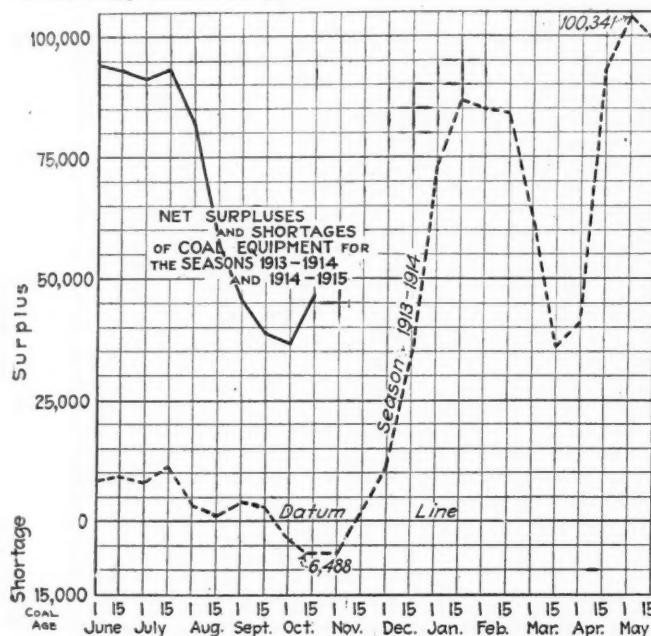
	September	Nine Months		
	1914	1913	1914	1913
Anthracite.....	996,528	813,394	8,149,935	7,665,020
Bituminous.....	4,291,425	4,378,037	36,112,774	37,774,323
Coke.....	736,261	1,127,951	7,603,937	10,859,413
Total.....	6,024,214	6,319,382	51,866,646	56,298,756

## THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended Oct. 15, as follows:

	Surplus	Shortage	Net*
New England Lines	492	0	492
N. Y.; New Jersey, Del.; Maryland; Eastern Penn.	5,249	20	5,229
Ohio; Indiana; Michigan; Western Pennsylvania	20,826	0	20,826
West Virginia, Virginia, North & South Carolina	5,819	185	5,634
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida	4,206	0	4,206
Iowa, Illinois, Wis., Minn.; North & South Dakota	5,717	0	5,717
Montana, Wyoming, Nebraska	584	10	574
Kansas, Colorado, Missouri, Arkansas, Oklahoma	1,703	273	1,430
Texas, Louisiana, New Mexico	167	8	159
Oregon, Idaho, California, Arizona	2,454	88	2,366
Canadian Lines	0	0	0
Total	47,217	584	46,633
June 15 July 1 July 15 Aug. 1 Aug. 15 Sept. 1 Sept. 15 Oct. 1			
Surplus	93,520	91,280	93,509
Shortage	49	430	292
Net*	94,763	90,850	93,217
	82,174	56,064	46,075
	39,367	37,224	

\*Bold face type indicates a surplus.



## CHESAPEAKE &amp; OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for August and the two months of the fiscal years 1913 and 1914, in short tons:

Destination	August			Two Months				
	1914	%	1913	1914	%	1913	%	
Tidewater	339,395	16	319,616	19	601,455	15	558,254	18
East	194,321	9	172,249	10	380,934	10	364,040	12
West	1,438,781	69	1,066,671	64	2,656,962	68	1,935,672	63
Total	1,972,497		1,558,536		3,639,351		2,857,966	
From Connections								
Bituminous	131,720	6	106,980	7	265,217	7	198,262	7
Anthracite	1,866		1,642		2,744		3,213	
Total	2,106,083	100	1,667,167	100	3,907,312	100	3,059,441	100
Coke	21,181		26,723		46,214		56,668	

## BALTIMORE &amp; OHIO RY.

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during July, August and September of this year and last year:

	July		August		September	
	1914	1913	1914	1913	1914	1913
Coal	2,594,407	2,938,723	2,769,453	3,295,123	2,878,963	3,001,733
Coke	255,650	391,485	242,283	391,999	237,661	387,704
Total	2,850,057	2,330,208	3,011,736	3,687,122	3,116,624	3,389,437

## FOREIGN MARKETS

## ENGLAND

**Business slow and unsatisfactory. War Department taking all the Admiralty coals. The problem of the unemployed.**

The London coal market is still moving very slowly. House coals are accumulating, and manufacturing qualities are not selling so freely. Slacks and small nuts have been over-plentiful, and prices are considerably weaker.

The present position of the coal trade is far from satisfactory. The indecisive period of the war is being prolonged beyond expectations, with the result that buyers hesitate to speculate. Shipowners are reluctant to send vessels to the mine-strewn area of the North Sea, and this has created a dearth of tonnage, and in addition to this, freight rates have kept on a high level. The Yorkshire markets are on the quiet side, and in the west a dislocation of traffic adds to the difficulties. The Cardiff position is best described as marking time. The Admiralty continue to take the whole of best Admiralty coals. Trade in Scotland is fair.

An Amsterdam telegram states that it is reported from Essen that negotiations concerning the renewal of the coal combination have come to a complete standstill. The period within which unaffiliated companies might join expired on Oct. 1, but the term has been extended.

The South Wales Miners' Federation express dissatisfaction with the results of the Parliamentary Committee's request for a special congress on the inadequate provision for the families of soldiers and sailors and the need for a state scheme dealing with unemployment. They have decided, failing assent of these bodies, to call on the Miners' Federation Council to summon a national conference of unions.—"The Colliery Guardian."

**Oct. 10**—Admiralty List coals are in good demand and prices are firmer. Dry coals also meet with a ready sale, but Monmouthshire descriptions are in good supply and values are unimproved. Cardiff small steams still offer cheaply. Quotations are approximately as follows:

Best Welsh steam	\$5.04@5.28	Best Monmouthshires	\$4.02@4.08
Best seconds	4.56@4.80	Seconds	3.84@3.96
Seconds	4.32@4.44	Best Cardiff small	1.92@1.98
Best dry coals	4.80@5.04	Seconds	1.32@1.56

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both net, exclusive of wharfage and for cash payment.

**Freights**—Chartering is a little busier, there being a better demand for tonnage. Rates are approximately as follows:

Gibraltar	\$1.68	Venice, Ancona	\$2.88	Singapore	\$2.64
Malta	1.68	Alexandria	1.92	Las Palmas	1.68
Marseilles	1.76	Port Said	1.86	St. Vincent	1.80
Algiers	1.56	Aden	2.40	Rio Janeiro	2.88
Genoa, Savona	1.92	Colombo	2.46	Monte Video	2.52
Naples	1.92	Sabang	2.46	Buenos Ayres	2.76

## GERMANY

**Shortage of miners and production heavily curtailed. Car supply also restricted and irregular. Requirements are still being met, however, and the market is relatively easy.**

Reports from the Rhenish-Westphalian coal market show great improvement. It is only a few weeks since the pits not belonging to the syndicate stated that the mining output had sunk to a little more than one-half normal owing to the reduction of about 65% in the operating force. In addition, the irregular, insufficient and, at times, altogether failing transportation service, made frequent holidays necessary. While on the one hand, coal users were clamoring for delivery, the demand for coke had ceased and large stocks were accumulating, even with the greatly diminished production.

Within the last few days conditions have shown a great change for the better. A large demand has appeared since the opening of railway service. Shipments are being made even to the Lower Rhine by rail. All the lump coal continues to be taken for the navy, exclusively so that the demand for this size has been diverted to other grades. The demand for small sizes is very urgent, and the mines are so fully provided with orders that it is impossible to satisfy them, even approximately.

The railways are well supplied and, in some instances, cancellations have been received from this quarter. Gas coals are scarce and it is hard to fill orders promptly. A fair demand for coke has sprung up, and important orders are confidently looked for from the Luxembourg blast furnaces, now that the railway service is about to be resumed in that section. The call for briquettes has slackened. Car conditions leave much to be desired, still only about 50% requirements be allotted. The embargo on exports of coal, coke and briquettes is now restricted to marine sizes. Rhine shipments by boat are subject to indefinite and prolonged delays at loading and discharging points.

The Coal Syndicate and the Dealers Association claim they are filling all existing contracts without any change in prices but they demand more on new orders or increased quantities. On the other hand, it is said that deliveries on contracts are slow.—Translated from the "Frankfurter Zeitung."